

AD-A034 378

AIR FORCE GEOPHYSICS LAB HANSCOM AFB MASS  
OBSERVED MEAN MONTHLY WINDS AT STANDARD PRESSURE SURFACES FROM --ETC(U)  
SEP 76 A J KANTOR

P70 472

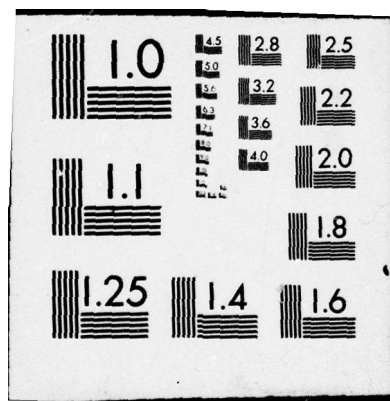
NL

UNCLASSIFIED

1 OF 1  
AD-A  
034 378



END  
DATE  
FILMED  
2-15-77  
NTIS



U.S. DEPARTMENT OF COMMERCE  
National Technical Information Service

AD-A034 378

OBSERVED MEAN MONTHLY WINDS AT STANDARD  
PRESSURE SURFACES FROM 850 MB TO 100 MB

AIR FORCE GEOPHYSICS LABORATORY  
HANSCOM AIR FORCE BASE, MASSACHUSETTS

30 SEPTEMBER 1976

ADA034378

018058

AFGL-TR-76-0234  
ENVIRONMENTAL RESEARCH PAPERS, NO. 578

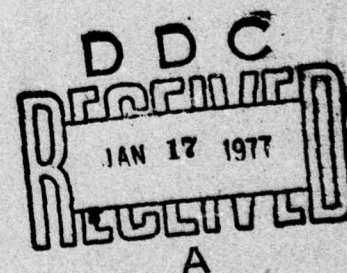


# Observed Mean Monthly Winds at Standard Pressure Surfaces From 850 mb to 100 mb

ARTHUR J. KANTOR

30 September 1976

Approved for public release; distribution unlimited.



METEOROLOGY DIVISION PROJECT 8624

**AIR FORCE GEOPHYSICS LABORATORY**

HANSCOM AFB, MASSACHUSETTS 01731

**AIR FORCE SYSTEMS COMMAND, USAF**

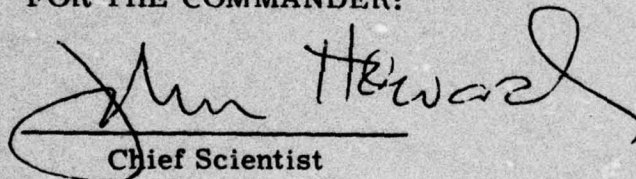


REPRODUCED BY  
NATIONAL TECHNICAL  
INFORMATION SERVICE  
U. S. DEPARTMENT OF COMMERCE  
SPRINGFIELD, VA. 22161



This technical report has been reviewed and  
is approved for publication.

FOR THE COMMANDER:

  
Chief Scientist

Qualified requestors may obtain additional copies from the Defense  
Documentation Center. All others should apply to the National  
Technical Information Service.

ACCESSION NO.	
NTIS	Write Section <input checked="" type="checkbox"/>
DDC	Diff Section <input type="checkbox"/>
UNANNOUNCED	<input type="checkbox"/>
JUSTIFICATION.....	
BY.....	
DISTRIBUTION/AVAILABILITY CODES	
Dist.	AVAIL. and/or SPECIAL
A	

Unclassified

SECURITY CLASSIFICATION OF THIS PAGE (When Data Entered)

REPORT DOCUMENTATION PAGE		READ INSTRUCTIONS BEFORE COMPLETING FORM
1. REPORT NUMBER AFGL-TR-76-0234	2. GOVT ACCESSION NO.	3. REPORT'S CATALOG NUMBER
4. TITLE (and Subtitle) OBSERVED MEAN MONTHLY WINDS AT STANDARD PRESSURE SURFACES FROM 850 mb TO 100 mb	5. TYPE OF REPORT & PERIOD COVERED Scientific, Final	
7. AUTHOR(s) Arthur J. Kantor	6. PERFORMING ORG. REPORT NUMBER ERP No. 578	
9. PERFORMING ORGANIZATION NAME AND ADDRESS Air Force Geophysics Laboratory (LY) Hanscom AFB Massachusetts 01731	8. CONTRACT OR GRANT NUMBER(s)	
11. CONTROLLING OFFICE NAME AND ADDRESS Air Force Geophysics Laboratory (LY) Hanscom AFB Massachusetts 01731	10. PROGRAM ELEMENT, PROJECT, TASK & WORK UNIT NUMBERS P. E. 62101F 86240105	
14. MONITORING AGENCY NAME & ADDRESS (if different from Controlling Office)	12. REPORT DATE 30 September 1976	
	13. NUMBER OF PAGES 44	
	15. SECURITY CLASS. (of this report) Unclassified	
	15a. DECLASSIFICATION/DOWNGRADING SCHEDULE	
16. DISTRIBUTION STATEMENT (of this Report)  Approved for public release; distribution unlimited.		
17. DISTRIBUTION STATEMENT (of the abstract entered in Block 20, if different from Report)		
18. SUPPLEMENTARY NOTES		
19. KEY WORDS (Continue on reverse side if necessary and identify by block number)  Upper-air winds Climatic winds Mean monthly winds		
20. ABSTRACT (Continue on reverse side if necessary and identify by block number)  This paper contains tables of mean monthly east-west and north-south wind components for January, April, July, and October at 200 Northern Hemisphere locations. The information provided herein is considered to be the best climatic mean monthly wind data currently available for these locations. However, it does not completely satisfy the need for an up-to-date wind atlas.		

DD FORM 1 JAN 73 1473 EDITION OF 1 NOV 65 IS OBSOLETE

Unclassified

SECURITY CLASSIFICATION OF THIS PAGE (When Data Entered)

## Contents

1. INTRODUCTION	5
2. OBSERVED VS "ATLAS" WINDS	6
3. MEAN MONTHLY OBSERVED WINDS	7
4. CONCLUSIONS	7

## Illustrations

1. Locations of 200 Northern Hemisphere Rawinsonde Stations	9
---	---

## Tables

1. Comparison of "Atlas" and Observed Mean Seasonal Wind Components	8
2. Climatic Mean Monthly Observed East-West and North-South Winds	10



## Observed Mean Monthly Winds at Standard Pressure Surfaces From 850 mb to 100 mb

### 1. INTRODUCTION

This paper contains mean east-west (zonal) and north-south (meridional) wind components for the seven standard pressure surfaces between 850 mb and 100 mb at 200 Northern Hemisphere rawinsonde stations. The wind components are based on at least 8 years of rawinsonde observations taken during the 10-year period from January 1964 through December 1973. Values were summarized from the publication Monthly Climatic Data for the World,<sup>1</sup> which contains mean monthly vector winds based on daily rawinsonde observations. For most stations, less than 10 percent of the daily observations are missing. No attempt was made to estimate any bias that may be introduced by the absence of these observations; however, in general, the strong wind cases are the most frequently missed observations, resulting in slightly smaller computed mean values than the true means. Because observing equipment has improved in recent years, fewer observations are missed now than prior to 1964.

---

(Received for publication 29 September 1970)

1. NOAA (1964-1974) Monthly Climatic Data for the World, January 1964-December 1973, U.S. Government Printing Office.

The climatic mean wind components provided in this paper were originally calculated for use in comparing observed and computer-deduced mean monthly winds.<sup>2</sup> This comparison led to the conclusion that winds based on daily rawinsonde observations provided better estimates of true climatic winds than the computer-generated values. This conclusion and the fact that one of the most highly regarded wind atlases available today is more than 17 years old,<sup>3</sup> has prompted publication of these tables.

These tables are based on at least 8 years of observations taken since 1964 and are considered to be good estimates of the true climatic winds. On the other hand, the charts in Crutcher's atlas<sup>3</sup> are based on observations taken between 1944 and early 1958. At that time, only 4 years of upper-air data were available for many locations. Consequently, a new atlas based on more recent observations is needed.

## 2. OBSERVED VS "ATLAS" WINDS

Mean seasonal "atlas" winds obtained from reference 3 were compared with the observed climatic winds published in this report for a number of Northern Hemisphere stations ranging in latitude from 14°N to 80°N. Winter (December, January, and February) and summer (June, July, and August) zonal and meridional winds for six of these stations are shown in Table 1 for six standard pressure levels, 850 through 100 mb. Speeds are in knots, and positive values represent winds from the west and south.

Values shown for the two methods are in general agreement. However, differences at some locations, levels, and seasons are significant, notably at the higher altitudes and speeds. For example, winter zonal winds for 200 and 300 mb at Kagoshima, Japan, and for 100 to 300 mb at Lihue, Kauai, Hawaii, do not compare well, in that observed winds are considerably larger than "atlas" values (see Table 1). At least a portion of these discrepancies is a result of the fact that "atlas" winds at the six stations shown are based on only 5 to 6 years of data, whereas the observed climatic winds are based on 10 years (9 years at Jan Mayen). Furthermore, the "atlas" winds were taken from data roughly 15 years older than that for the climatic winds in this paper; hence, the actual period of record at the higher pressure altitudes is for even fewer years than indicated in both Crutcher's atlas and Table 1. Much of the missing data at the higher altitudes was undoubtedly

2. Kantor, A.J. (1976) A Comparison Between Observed and Deduced Mean Monthly Winds from 700 mb to 200 mb, ERP No. 548, AFCHL-TR-76-0044.

3. Crutcher, H.L. (1959) Upper Wind Statistics Charts of the Northern Hemisphere, NAVAER 50-IC-535, Volumes I and II.



due to strong winds aloft in winter that severely affected the older rawinsonde tracking equipment. Consequently, the resulting bias toward lighter winds (at the higher levels) is greater in the earlier "atlas" data.

### 3. MEAN MONTHLY OBSERVED WINDS

Climatic mean monthly observed winds are provided in Table 2 for the 200 Northern Hemisphere locations shown in Figure 1. Based on at least 8 years of daily observations, as described earlier, the mean zonal and meridional winds presented in Table 2 are for the midseason months January, April, July, and October. Again, speeds are in knots, and positive values represent winds from the west and south.

### 4. CONCLUSIONS

The information provided in Table 2 is considered to be the best climatic mean monthly wind data currently available. Moreover, it indicates a need for the construction of an up-to-date, upper-air wind atlas that will contain scalar wind speeds, standard vector deviations, and standard deviations of zonal and meridional components.

Table 1. Comparison of "Atlas" and Observed Mean Seasonal Wind Components\*

Guam (14°N, 145°E)  
(Period of Record: Atlas, 5-1/2 yr; Observed, 10 yr)

mb	Winter		Summer	
	E/W Atlas Obs.	N/S Atlas Obs.	E/W Atlas Obs.	N/S Atlas Obs.
850	-15	0	-9	3
700	-15	2	-8	4
500	-11	2	-10	3
300	-5	2	-4	-1
200	-4	3	-5	-3
100	-10	5	-17	-4

Kagoshima (32°N, 131°E)  
(Period of Record: Atlas, 6 yr; Observed, 10 yr)

850	20	14	-4	-6	3	4	5	5
700	31	33	-4	-4	7	10	3	4
500	62	63	-3	2	15	16	3	3
300	98	117	2	7	22	25	4	3
200	110	130	3	16	20	24	6	0
100	85	84	5	9	8	4	-6	-6

Churchill (50°N, 94°W)  
(Period of Record: Atlas, 5 yr; Observed, 10 yr)

850	5	7	-3	-7	7	6	-2	-6
700	12	12	-6	-7	10	10	-6	-8
500	22	16	-10	-10	16	17	-8	-11
300	28	23	-14	-12	23	26	-11	-16
200	29	23	-13	-12	23	26	-10	-11
100	26	24	-11	-13	10	9	-6	-8

Lihue, Kauai (22°N, 160°W)  
(Period of Record: Atlas, 6 yr; Observed, 10 yr)

mb	Winter		Summer	
	E/W Atlas Obs.	N/S Atlas Obs.	E/W Atlas Obs.	N/S Atlas Obs.
850	-7	1	-11	-5
700	-1	3	-7	-2
500	9	16	-2	0
300	31	38	-8	6
200	43	53	-11	27
100	19	30	-11	0

Ship Delta (44°N, 43°W)  
(Period of Record: Atlas, 5 yr; Observed, 10 yr)

850	17	17	6	7	13	16	3	4
700	25	21	6	9	17	20	3	3
500	37	23	11	14	23	27	3	2
300	45	44	14	16	33	34	0	1
200	44	45	12	14	35	36	-1	-2
100	27	31	6	6	17	12	1	0

San Mayen (71°N, 9°W)  
(Period of Record: Atlas, 5 yr; Observed, 9 Yr)

850	6	3	-2	-3	3	2	0	0
700	8	8	2	0	5	4	1	2
500	14	17	7	-1	4	7	1	3
300	23	26	6	-3	10	11	3	4
200	23	26	2	-3	9	10	3	4
100	27	33	2	-4	2	4	5	4

\*Speed is in knots; winds from the west and south are positive.

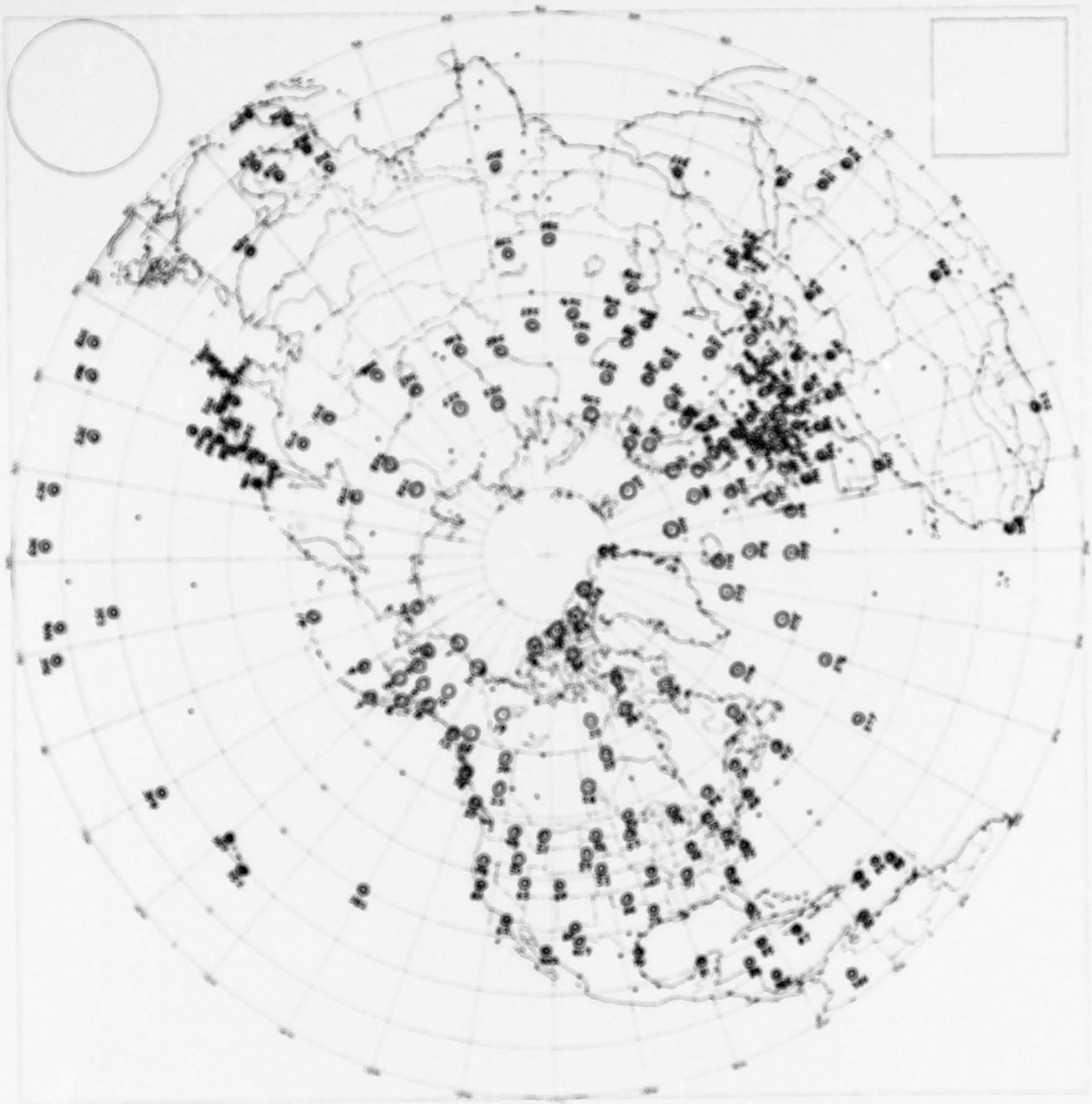


Figure 1. Locations of 200 Northern Hemisphere Rawinsonde Stations

Table 2. Climatic Mean Monthly Observed East-West and North-South Winds\*

#1 Barrow (71°N, 157°W)

mb	JAN E/W N/S	APR E/W N/S	JULY E/W N/S	OCT E/W N/S
850	-5	-4	5	-3
700	0	0	7	1
500	8	4	13	6
300	17	10	13	12
200	21	11	10	14
150	25	11	6	15
100	33	11	2	17

#4 Nome (64°N, 165°W)

mb	JAN E/W N/S	APR E/W N/S	JULY E/W N/S	OCT E/W N/S
850	-3	-2	1	0
700	2	2	2	4
500	8	6	3	8
300	16	14	6	14
200	18	14	7	17
150	22	13	5	17
100	27	12	1	19

#2 Barter (70°N, 144°W)

850	3	-1	7	0	1
700	3	-4	10	4	3
500	8	-8	12	11	7
300	17	-12	18	20	11
200	21	-9	16	20	10
150	25	-9	15	21	9
100	32	-10	14	21	8

#5 Bethel (61°N, 162°W)

850	0	3	5	8	3
700	4	5	6	8	6
500	11	10	7	10	1
300	18	20	8	10	4
200	21	18	8	11	7
150	23	17	9	11	7
100	24	12	8	1	7

#3 Kotzebue (67°N, 163°W)

850	-4	2	3	6	3
700	1	0	5	8	1
500	9	1	8	8	5
300	19	4	10	10	13
200	22	6	9	12	10
150	24	7	10	15	10
100	31	9	10	17	10

#6 King Salmon (59°N, 157°W)

850	0	-3	2	3	2
700	4	-2	7	4	6
500	11	-3	13	5	11
300	16	-2	23	14	19
200	21	0	21	16	24
150	22	2	19	11	24
100	21	1	15	4	22

\*Speed is in knots; winds from the west and south are positive

Table 2. Climatic Mean Monthly Observed East-West and North-South Winds\* (Cont.)

#7 Cold Bay (55°N, 163°W)

mb	JAN E/W N/S	APR E/W N/S	JULY E/W N/S	OCT E/W N/S
850	3 0	10 1	5 4	10 -4
700	8 0	14 2	9 4	14 -4
500	14 7	22 5	15 3	20 -1
300	20 12	28 7	24 2	29 4
200	21 11	27 9	23 -1	29 4
150	19 11	23 9	16 -1	28 6
100	17 9	15 8	7 0	24 5

#10 Fairbanks (65°N, 148°W)

mb	JAN E/W N/S	APR E/W N/S	JULY E/W N/S	OCT E/W N/S
850	-5 1	3 4	6 3	0 5
700	2 -1	6 6	5 5	5 8
500	6 -5	10 9	7 6	10 11
300	16 -8	18 10	7 7	16 14
200	22 -6	16 9	4 4	19 11
150	25 -4	15 6	3 3	19 10
100	31 -6	13 5	2 2	20 8

#8 McGrath (63°N, 156°W)

mb	JAN E/W N/S	APR E/W N/S	JULY E/W N/S	OCT E/W N/S
850	-6 -1	0 4	3 6	-1 2
700	2 -1	3 7	2 7	3 5
500	8 0	7 8	3 6	6 9
300	18 -1	15 7	7 6	14 11
200	23 2	15 5	8 2	19 7
150	25 2	14 5	6 2	18 8
100	28 3	12 6	1 1	19 7

#11 Anchorage (61°N, 150°W)

mb	JAN E/W N/S	APR E/W N/S	JULY E/W N/S	OCT E/W N/S
850	-4 -3	-4 4	-2 4	-2 4
700	0 -1	0 9	-2 5	-1 9
500	8 -3	8 10	2 5	6 12
300	17 -3	19 9	6 5	16 14
200	23 -2	17 6	9 2	21 10
150	24 -1	16 6	2 2	21 9
100	25 -2	12 5	2 2	20 8

#9 St. Paul (57°N, 170°W)

mb	JAN E/W N/S	APR E/W N/S	JULY E/W N/S	OCT E/W N/S
850	1 4	5 0	3 5	-2 8
700	4 5	9 1	5 4	-2 12
500	9 8	16 2	9 3	-3 18
300	14 15	24 7	15 2	0 24
200	16 13	23 5	18 1	1 27
150	16 14	20 7	12 0	2 26
100	17 13	15 7	5 0	23 3

#12 Yakutat (60°N, 140°W)

mb	JAN E/W N/S	APR E/W N/S	JULY E/W N/S	OCT E/W N/S
850	-5 4	-5 8	-3 5	-6 11
700	1 4	1 8	-2 4	1 12
500	12 2	8 7	0 4	10 15
300	25 -6	19 3	4 3	22 12
200	25 -8	19 1	8 2	26 7
150	26 -8	16 2	7 3	25 7
100	26 -9	12 3	2 2	22 6

\* Speed is in knots; winds from the west and south are positive



Table 2. Climatic Mean Monthly Observed East-West and North-South Winds\* (Cont.)

#13 Annette I. (55°N, 132°W)

mb	JAN E/W	JAN N/S	APR E/W	APR N/S	JULY E/W	JULY N/S	OCT E/W	OCT N/S
850	1	9	1	11	1	5	3	15
700	10	7	7	9	4	4	12	14
500	21	1	15	7	9	4	22	15
300	30	-3	25	-1	16	4	34	8
200	29	-8	22	-3	16	2	33	1
150	28	-9	17	-2	12	3	29	2
100	26	-11	12	0	6	3	22	1

#16 Mould Bay (76°N, 120°W)

mb	JAN E/W	JAN N/S	APR E/W	APR N/S	JULY E/W	JULY N/S	OCT E/W	OCT N/S
850	2	-8	2	-4	8	-2	3	-2
700	1	-10	5	-6	11	-4	6	-3
500	1	-13	8	-8	16	-6	10	-4
300	4	-15	12	-8	20	-8	18	-4
200	10	-15	13	-5	12	-5	18	-1
150	13	-16	13	-4	8	-4	18	0
100	20	-19	13	-2	3	-3	18	2

#14 Shemya (53°N, 174°E)

mb	JAN E/W	JAN N/S	APR E/W	APR N/S	JULY E/W	JULY N/S	OCT E/W	OCT N/S
850	1	6	7	2	4	3	13	-2
700	4	8	12	1	8	3	17	-3
500	8	13	20	2	14	2	28	-5
300	14	18	30	4	25	0	43	-8
200	16	18	30	6	26	0	48	-5
150	18	17	27	6	20	-1	42	-3
100	16	16	21	7	10	-1	34	0

#18 Whitehorse (61°N, 135°W)

mb	JAN E/W	JAN N/S	APR E/W	APR N/S	JULY E/W	JULY N/S	OCT E/W	OCT N/S
850	1	1	1	7	2	3	-1	10
700	6	1	8	6	3	2	10	11
500	12	-1	11	6	3	3	14	11
300	25	-6	19	7	5	3	26	14
200	25	-8	17	5	9	1	27	11
150	26	-9	15	4	7	2	25	8
100	27	-10	11	4	4	2	24	6

#15 Isachsen (79°N, 104°W)

mb	JAN E/W	JAN N/S	APR E/W	APR N/S	JULY E/W	JULY N/S	OCT E/W	OCT N/S
850	0	-7	2	-4	6	-2	1	0
700	-1	-8	2	-6	8	-3	3	-2
500	-2	-8	3	-8	12	-4	7	-2
300	-1	-7	5	-7	15	-6	13	-1
200	2	-8	8	-5	7	-5	14	0
150	5	-10	8	-3	4	-4	15	1
100	12	-13	10	-2	1	-3	16	2

#19 Norman Wells (65°N, 127°W)

mb	JAN E/W	JAN N/S	APR E/W	APR N/S	JULY E/W	JULY N/S	OCT E/W	OCT N/S
850	7	-4	4	1	3	-2	6	0
700	7	-6	10	0	6	-3	11	0
500	14	-8	14	0	9	-3	18	2
300	19	-12	21	0	15	-4	26	4
200	21	-14	18	0	14	-3	27	3
150	24	-15	16	1	10	-1	25	3
100	29	-18	11	1	5	-1	24	3

\* Speed is in knots; winds from the west and south are positive

Table 2. Climatic Mean Monthly Observed East-West and North-South Winds\* (Cont.)

#22 Prince George (54°N, 123°W)

mb	JAN E/W	JAN N/S	APR E/W	APR N/S	JULY E/W	JULY N/S	OCT E/W	OCT N/S
850	4	6	6	4	6	0	8	11
700	16	2	11	5	10	4	18	5
500	28	0	18	3	14	5	29	4
300	42	-4	29	3	21	7	43	3
200	38	-9	24	0	23	6	41	-2
150	33	-9	18	0	19	6	34	-1
100	29	-10	13	1	10	4	26	0

#27 Port Hardy (51°N, 127°W)

mb	JAN E/W	JAN N/S	APR E/W	APR N/S	JULY E/W	JULY N/S	OCT E/W	OCT N/S
850	6	9	4	7	2	2	6	10
700	17	7	10	7	7	3	15	11
500	31	3	20	4	15	4	29	9
300	48	-1	34	-2	24	5	50	6
200	43	-5	30	-4	26	6	58	0
150	35	-7	22	-2	21	7	38	0
100	27	-7	15	-1	11	5	24	0

#24 Fort Nelson (59°N, 123°W)

mb	JAN E/W	JAN N/S	APR E/W	APR N/S	JULY E/W	JULY N/S	OCT E/W	OCT N/S
850	6	-3	5	-1	5	-4	9	-2
700	12	-4	10	0	6	-2	16	-2
500	22	-5	17	3	9	0	24	1
300	35	-10	25	3	13	1	40	2
200	31	-12	21	1	14	1	41	0
150	30	-13	17	1	12	1	33	1
100	29	-15	13	0	8	1	26	1

#28 Alert (82°N, 62°W)

mb	JAN E/W	JAN N/S	APR E/W	APR N/S	JULY E/W	JULY N/S	OCT E/W	OCT N/S
850	0	-1	1	0	4	1	4	0
700	0	2	-2	2	4	2	5	1
500	1	5	-3	5	6	4	8	1
300	3	7	1	6	6	5	11	3
200	4	5	4	5	1	3	12	3
150	5	3	6	3	0	2	12	2
100	7	-1	8	1	-2	1	14	2

#26 The Pas (54°N, 101°W)

mb	JAN E/W	JAN N/S	APR E/W	APR N/S	JULY E/W	JULY N/S	OCT E/W	OCT N/S
850	8	-5	4	-2	6	-3	8	-5
700	15	-7	10	-5	12	-5	14	-7
500	26	-10	18	-5	20	-6	24	-9
300	37	-16	25	-2	33	-6	38	-11
200	36	-15	25	-4	35	-4	42	-9
150	34	-14	21	-2	28	-5	34	-8
100	33	-16	16	-2	16	-4	25	-5

#29 Eureka (80°N, 86°W)

mb	JAN E/W	JAN N/S	APR E/W	APR N/S	JULY E/W	JULY N/S	OCT E/W	OCT N/S
850	-2	-2	-1	0	2	2	0	1
700	-2	-1	-1	-1	4	0	2	1
500	-1	0	-1	-2	6	-1	4	2
300	0	1	1	-1	9	-4	9	3
200	0	-1	4	0	4	-2	11	2
150	4	-3	6	0	1	-1	11	2
100	6	-7	8	0	-1	-1	12	2

\* Speed is in knots; winds from the west and south are positive

Table 2. Climatic Mean Monthly Observed East-West and North-South Winds\* (Cont.)

#30 Resolute (75°N, 95°W)

mb	JAN E/W	JAN N/S	APR E/W	APR N/S	JULY E/W	JULY N/S	OCT E/W	OCT N/S
850	0	-4	2	-3	4	-4	2	0
700	0	-5	4	-6	6	-6	4	-1
500	-1	-2	6	-7	9	-7	8	-2
300	1	-2	10	-7	13	-8	15	-3
200	4	-5	10	-4	8	-7	15	-2
150	6	-7	10	-4	5	-5	15	-2
100	12	-12	10	-2	1	-3	16	-2

#34 Coral Harbor (64°N, 83°W)

mb	JAN E/W	JAN N/S	APR E/W	APR N/S	JULY E/W	JULY N/S	OCT E/W	OCT N/S
850	2	-2	4	-4	1	-5	2	-3
700	5	-2	9	-5	3	-8	6	-4
500	7	0	16	-5	6	-8	13	-4
300	12	4	20	-3	8	-8	19	2
200	14	0	17	-3	8	-6	22	-3
150	15	-2	17	-2	6	-4	20	-3
100	18	-4	12	-3	2	-4	19	-3

#31 Hall Beach (69°N, 81°W)

mb	JAN E/W	JAN N/S	APR E/W	APR N/S	JULY E/W	JULY N/S	OCT E/W	OCT N/S
850	0	-2	4	-3	1	-4	2	-3
700	1	1	8	-2	3	-4	4	-2
500	3	4	14	-1	6	-5	9	-1
300	6	8	18	1	9	-6	17	-2
200	9	3	15	1	7	-4	17	-1
150	10	1	12	1	4	-3	16	-1
100	13	-4	10	0	1	-2	16	-2

#35 Frobisher Bay (64°N, 69°W)

mb	JAN E/W	JAN N/S	APR E/W	APR N/S	JULY E/W	JULY N/S	OCT E/W	OCT N/S
850	2	0	3	-1	-1	1	1	1
700	4	4	7	0	1	-1	4	0
500	4	9	12	2	4	0	9	1
300	7	13	16	5	6	3	17	1
200	10	10	15	5	6	3	18	2
150	13	9	12	4	5	2	17	2
100	16	7	9	3	2	1	18	1

#33 Baker Lake (64°N, 96°W)

mb	JAN E/W	JAN N/S	APR E/W	APR N/S	JULY E/W	JULY N/S	OCT E/W	OCT N/S
850	3	-6	6	-4	3	-6	5	-3
700	6	-6	11	-6	6	-8	8	-5
500	11	-6	19	-7	10	-10	15	-7
300	15	-6	27	-10	15	-10	23	-7
200	16	-9	20	-9	14	-8	24	-6
150	19	-12	17	-6	10	-8	23	-6
100	23	-17	14	-5	5	-7	21	-6

#39 Churchill (59°N, 94°W)

mb	JAN E/W	JAN N/S	APR E/W	APR N/S	JULY E/W	JULY N/S	OCT E/W	OCT N/S
850	6	-8	5	-6	4	-7	6	-6
700	11	-7	9	-6	7	-8	11	-7
500	16	-8	19	-9	13	-10	19	-9
300	24	-9	31	-8	22	-11	31	-8
200	25	-11	26	-7	23	-10	32	-8
150	26	-13	22	-6	18	-8	29	-7
100	30	-14	16	-5	10	-7	24	-6

\* Speed is in knots; winds from the west and south are positive

Table 2. Climatic Mean Monthly Observed East-West and North-South Winds\* (Cont.)

#40 Goose Bay (53°N, 60°W)

mb	JAN E/W	JAN N/S	APR E/W	APR N/S	JULY E/W	JULY N/S	OCT E/W	OCT N/S
850	4	-7	2	-4	11	1	11	-2
700	8	-2	5	-2	17	1	17	-2
500	14	2	11	1	24	4	28	1
300	24	8	21	6	37	8	44	5
200	31	9	19	5	37	8	44	6
150	32	9	16	6	27	6	36	4
100	34	9	12	5	13	3	26	2

#48 Medford (42°N, 123°W)

mb	JAN E/W	JAN N/S	APR E/W	APR N/S	JULY E/W	JULY N/S	OCT E/W	OCT N/S
850	6	8	2	1	-1	0	0	4
700	22	2	10	-2	8	8	10	1
500	35	-3	21	-6	17	10	22	-3
300	47	-7	30	-12	28	15	30	-7
200	47	-11	33	-10	37	21	34	-7
150	40	-11	28	-5	32	19	34	-5
100	28	-8	20	-2	12	8	23	-3

#44 Maniwaki (46°N, 76°W)

mb	JAN E/W	JAN N/S	APR E/W	APR N/S	JULY E/W	JULY N/S	OCT E/W	OCT N/S
850	14	-4	7	-2	12	-1	13	1
700	23	-4	15	-5	19	-2	21	0
500	37	-6	28	-8	27	-3	31	1
300	55	-1	41	-12	35	-1	45	0
200	54	0	39	-10	44	-4	47	-2
150	50	0	33	-6	34	-2	41	0
100	40	0	23	-4	16	-2	28	0

#49 Spokane (48°N, 118°W)

mb	JAN E/W	JAN N/S	APR E/W	APR N/S	JULY E/W	JULY N/S	OCT E/W	OCT N/S
850	12	10	7	6	5	3	7	5
700	22	3	11	4	11	5	16	2
500	37	-3	18	2	21	9	27	-1
300	56	-10	27	-1	37	15	38	-7
200	51	-14	27	-3	45	16	41	-8
150	40	-12	21	-2	35	12	35	-5
100	31	-9	15	1	15	5	25	-3

#45 Sable Island (44°N, 60°W)

mb	JAN E/W	JAN N/S	APR E/W	APR N/S	JULY E/W	JULY N/S	OCT E/W	OCT N/S
850	20	-2	10	-3	15	5	16	0
700	31	0	18	0	21	4	24	1
500	47	3	28	2	30	6	36	2
300	72	4	41	4	41	8	47	3
200	66	0	41	2	44	6	53	0
150	55	2	32	0	34	4	44	1
100	44	3	22	2	14	2	28	0

#50 Boise (44°N, 116°W)

mb	JAN E/W	JAN N/S	APR E/W	APR N/S	JULY E/W	JULY N/S	OCT E/W	OCT N/S
850	4	4	4	-4	2	-3	2	0
700	20	-2	11	-4	9	2	11	-2
500	35	-6	18	0	21	11	21	-3
300	50	-13	25	-1	35	16	30	-6
200	49	-15	28	-3	44	21	33	-9
150	39	-11	24	0	39	16	32	-6
100	30	-9	18	2	14	6	23	-4

\* Speed is in knots; winds from the west and south are positive



Table 2. Climatic Mean Monthly Observed East-West and North-South Winds\* (Cont.)

#51 Great Falls (47°N, 111°W)

mb	JAN E/W	JAN N/S	APR E/W	APR N/S	JULY E/W	JULY N/S	OCT E/W	OCT N/S
850	15	7	10	3	6	2	15	6
700	27	-5	12	-3	13	2	18	-4
500	36	-11	18	-1	27	6	28	-6
300	52	-17	26	1	42	8	40	-9
200	47	-15	25	1	33	10	39	-9
150	41	-11	22	1	42	7	36	-6
100	31	-9	16	2	17	3	24	-3

#54 Rapid City (44°N, 103°W)

mb	JAN E/W	JAN N/S	APR E/W	APR N/S	JULY E/W	JULY N/S	OCT E/W	OCT N/S
850	11	-7	7	-5	4	2	9	-8
700	22	-12	12	-5	14	-2	14	-8
500	35	-13	21	0	22	-3	26	-7
300	50	-18	30	4	40	-3	36	-5
200	50	-14	35	4	52	-4	40	-6
150	46	-9	32	3	43	-4	36	-4
100	35	-8	23	2	16	-3	24	-4

#52 Bismark (47°N, 101°W)

mb	JAN E/W	JAN N/S	APR E/W	APR N/S	JULY E/W	JULY N/S	OCT E/W	OCT N/S
850	12	-8	4	-3	7	-1	10	-7
700	22	-11	11	-5	16	-5	18	-9
500	36	-15	22	-3	28	-7	28	-8
300	52	-18	31	0	43	-8	38	-7
200	49	-15	34	2	54	-7	44	-7
150	46	-12	28	0	44	-7	38	-5
100	37	-11	22	-1	18	-5	26	-6

#55 International Falls (49°N, 93°W)

mb	JAN E/W	JAN N/S	APR E/W	APR N/S	JULY E/W	JULY N/S	OCT E/W	OCT N/S
850	12	-5	4	-2	11	-2	11	-2
700	20	-9	11	-4	16	-6	18	-4
500	32	-12	22	-5	26	-10	28	-6
300	47	-15	35	-5	41	-14	41	-8
200	46	-13	34	-3	50	-14	44	-6
150	43	-10	29	-3	38	-12	36	-5
100	37	-11	22	-3	19	-8	25	-5

#53 North Platte (41°N, 101°W)

mb	JAN E/W	JAN N/S	APR E/W	APR N/S	JULY E/W	JULY N/S	OCT E/W	OCT N/S
850	11	-7	5	-2	5	6	7	-4
700	21	-10	14	-3	8	0	14	-6
500	34	-11	24	2	16	-6	23	-4
300	47	-13	38	7	34	-7	33	-4
200	56	-10	44	10	42	-8	41	-4
150	51	-7	39	5	36	-10	39	-4
100	35	-7	27	2	12	-4	24	-3

#56 Saulte Ste Marie (46°N, 84°W)

mb	JAN E/W	JAN N/S	APR E/W	APR N/S	JULY E/W	JULY N/S	OCT E/W	OCT N/S
850	13	-3	7	-1	11	-2	13	1
700	22	-4	14	-3	18	-4	20	1
500	35	-5	26	-6	28	-7	30	0
300	54	-4	42	-7	38	-11	43	-2
200	55	-3	45	-5	46	-15	46	-2
150	50	-4	35	-5	34	-12	40	-2
100	44	-4	25	-4	17	-6	27	-2

\* Speed is in knots; winds from the west and south are positive



Table 2. Climatic Mean Monthly Observed East-West and North-South Winds\* (Cont.)

#57 St. Cloud (46°N, 94°W)

mb	JAN E/W	JAN N/S	APR E/W	APR N/S	JULY E/W	JULY N/S	OCT E/W	OCT N/S
850	13	-6	5	-2	10	-2	12	-2
700	22	-10	14	-3	15	-6	19	-5
500	36	-14	23	-4	25	-10	29	-3
300	53	-15	36	-2	40	-13	40	-5
200	52	-11	41	0	50	-13	44	-4
150	47	-10	34	-2	40	-14	40	-4
100	38	-9	23	-1	17	-8	26	-4

#60 Nantucket (41°N, 70°W)

mb	JAN E/W	JAN N/S	APR E/W	APR N/S	JULY E/W	JULY N/S	OCT E/W	OCT N/S
850	19	-5	12	-6	10	1	13	0
700	32	-2	22	-6	17	1	21	2
500	50	0	34	-8	25	4	32	6
300	73	3	50	-11	37	8	46	9
200	74	-1	51	-12	42	4	51	5
150	62	1	42	-8	33	0	44	4
100	47	1	31	-6	15	-1	31	4

#58 Buffalo (43°N, 79°W)

mb	JAN E/W	JAN N/S	APR E/W	APR N/S	JULY E/W	JULY N/S	OCT E/W	OCT N/S
850	20	1	13	-1	12	-1	15	2
700	31	-2	22	-4	17	-1	21	1
500	48	-2	33	-7	25	-1	31	1
300	63	2	48	-9	35	-2	43	3
200	62	-1	49	-9	42	-7	47	2
150	53	-1	39	-6	32	-5	41	2
100	43	-1	27	-3	17	-3	29	1

#61 Oakland (38°N, 122°W)

mb	JAN E/W	JAN N/S	APR E/W	APR N/S	JULY E/W	JULY N/S	OCT E/W	OCT N/S
850	7	0	6	-4	5	0	2	-2
700	15	-3	10	-5	4	6	6	-2
500	28	-6	20	-10	9	8	15	-5
300	41	-11	33	-14	19	14	22	-8
200	47	-14	39	-12	24	22	29	-9
150	42	-12	36	-6	24	22	29	-6
100	28	-9	25	-1	6	7	21	-4

#59 Caribou (47°N, 68°W)

mb	JAN E/W	JAN N/S	APR E/W	APR N/S	JULY E/W	JULY N/S	OCT E/W	OCT N/S
850	14	-6	8	-6	12	0	14	-3
700	23	-4	14	-6	19	1	22	-2
500	38	0	24	-6	30	3	35	1
300	57	5	36	-6	43	8	48	5
200	56	3	36	-5	46	5	50	2
150	50	4	29	-3	36	5	43	1
100	42	4	21	-1	16	2	29	1

#62 San Diego (33°N, 117°W)

mb	JAN E/W	JAN N/S	APR E/W	APR N/S	JULY E/W	JULY N/S	OCT E/W	OCT N/S
850	4	-3	7	-3	4	-2	2	-2
700	12	-5	13	-2	2	7	5	-1
500	22	-8	27	-2	2	7	14	-2
300	36	-11	42	1	9	14	28	-2
200	49	-9	52	3	10	22	37	-1
150	47	-6	50	6	9	20	36	1
100	33	-4	34	6	-3	5	20	-2

\*Speed is in knots; winds from the west and south are positive

Table 2. Climatic Mean Monthly Observed East-West and North-South Winds\* (Cont.)

#63 Ely (39°N, 115°W)

mb	JAN		APR		JULY		OCT	
	E/W	N/S	E/W	N/S	E/W	N/S	E/W	N/S
850	-	-	-	-	-	-	-	-
700	11	-2	7	-1	6	7	5	0
500	27	-10	19	0	10	10	16	-4
300	37	-16	29	-1	26	16	23	-4
200	44	-16	34	-2	36	24	28	-6
150	42	-12	31	1	31	17	28	-3
100	29	-9	21	3	6	6	18	-3

#66 Oklahoma City (35°N, 98°W)

mb	JAN		APR		JULY		OCT	
	E/W	N/S	E/W	N/S	E/W	N/S	E/W	N/S
850	13	1	12	7	8	9	9	5
700	23	-1	20	4	3	1	12	0
500	42	1	33	6	4	-3	21	1
300	61	2	55	14	8	-11	38	3
200	76	1	66	14	10	-16	50	3
150	68	1	58	8	8	-14	45	1
100	51	0	39	4	-3	-6	27	0

#64 Grand Junction (39°N, 109°W)

850	-4	2	-5	3	-15	-1	-5	3
700	12	1	9	4	6	0	7	1
500	28	-9	21	6	18	19	17	-2
300	43	-15	36	5	22	-6	30	-3
200	47	-16	40	5	31	10	36	-3
150	42	-10	35	6	25	10	33	-2
100	30	-6	25	6	4	-1	21	-2

#67 Columbia (39°N, 92°W)

850	16	-2	16	3	10	0	14	-2
700	24	-5	23	0	10	-4	18	-4
500	40	-4	37	2	13	-8	28	-3
300	58	-4	55	7	20	18	39	-6
200	62	-4	65	8	24	-22	47	-5
150	56	-3	54	2	20	-20	44	-4
100	42	-4	33	1	6	-10	28	-2

#65 El Paso (32°N, 106°W)

850	-4	-3	6	-2	-2	3	1	1
700	18	-1	18	6	-2	3	9	3
500	29	-2	34	12	-7	0	18	3
300	48	1	54	17	-4	-1	31	4
200	59	1	60	15	-3	-3	44	5
150	54	1	60	14	-4	-2	42	4
100	39	0	40	9	-10	-2	23	0

#68 Dayton (40°N, 84°W)

850	20	0	15	1	10	-1	12	1
700	31	0	23	-1	14	-2	18	1
500	48	2	36	-2	18	-3	27	2
300	71	7	54	-3	28	-7	41	2
200	76	4	61	-4	35	-12	49	2
150	66	4	50	-5	26	-11	43	0
100	50	2	35	-3	12	-6	28	0

\* Speed is in knots; winds from the west and south are positive

Table 2. Climatic Mean Monthly Observed East-West and North-South Winds\* (Cont.)

#70 Brownsville (26°N, 97°W)

mb	JAN E/W	JAN N/S	APR E/W	APR N/S	JULY E/W	JULY N/S	OCT E/W	OCT N/S
850	3	8	0	16	-4	16	-2	3
700	13	6	9	8	-6	6	2	-1
500	30	8	23	4	-6	0	9	1
300	56	16	50	7	-8	-6	27	4
200	68	17	67	9	-11	-7	39	3
150	62	17	63	12	-13	-9	34	4
100	42	11	36	9	-19	-7	16	0

#74 Washington (Dulles) (39°N, 77°W)

mb	JAN E/W	JAN N/S	APR E/W	APR N/S	JULY E/W	JULY N/S	OCT E/W	OCT N/S
850	18	-6	14	-4	7	-2	9	-2
700	31	-1	22	-5	14	0	16	0
500	51	2	36	-5	20	2	26	2
300	77	6	56	-9	30	1	39	4
200	83	2	62	-14	34	-4	49	3
150	70	2	51	-10	26	-4	43	3
100	52	2	34	-5	11	-3	28	2

#71 Nashville (36°N, 87°W)

mb	JAN E/W	JAN N/S	APR E/W	APR N/S	JULY E/W	JULY N/S	OCT E/W	OCT N/S
850	16	0	14	3	8	0	8	1
700	29	0	22	1	9	-1	13	0
500	48	3	38	1	11	-3	23	1
300	70	9	56	0	17	-8	38	0
200	80	9	69	-2	20	-11	50	0
150	70	5	60	-2	14	-13	46	0
100	52	3	33	3	2	-6	27	0

#75 Cape Hatteras (35°N, 76°W)

mb	JAN E/W	JAN N/S	APR E/W	APR N/S	JULY E/W	JULY N/S	OCT E/W	OCT N/S
850	19	1	13	-3	8	2	4	0
700	33	2	23	-3	12	3	11	2
500	54	4	37	-6	14	3	22	3
300	77	9	55	-10	15	2	36	6
200	88	3	63	-18	17	-4	48	3
150	72	2	57	-12	12	-6	43	0
100	58	2	40	-7	1	-3	26	0

#72 Shreveport (32°N, 94°W)

mb	JAN E/W	JAN N/S	APR E/W	APR N/S	JULY E/W	JULY N/S	OCT E/W	OCT N/S
850	13	2	10	9	3	4	4	1
700	23	1	19	3	1	1	9	-1
500	41	4	34	5	0	-3	19	0
300	62	10	57	8	-2	-10	35	1
200	77	10	72	6	-2	-13	47	0
150	67	7	66	5	-4	-13	44	0
100	50	4	43	4	-9	-6	24	0

#76 Charleston (33°N, 80°W)

mb	JAN E/W	JAN N/S	APR E/W	APR N/S	JULY E/W	JULY N/S	OCT E/W	OCT N/S
850	17	3	12	-1	7	3	2	0
700	29	3	20	-2	8	2	10	1
500	48	4	35	-5	8	2	19	2
300	74	8	51	-8	7	0	33	1
200	87	8	64	-13	6	-5	45	1
150	79	6	57	-11	2	-7	41	0
100	56	5	40	-6	-4	-4	24	-1

\*Speed is in knots; winds from the west and south are positive

Table 2. Climatic Mean Monthly Observed East-West and North-South Winds\* (Cont.)

#77 Miami (26°N, 80°W)

mb	JAN E/W N/S	APR E/W N/S	JULY E/W N/S	OCT E/W N/S
850	3	-1	-5	-4
700	12	6	-4	2
500	28	4	-2	8
300	49	5	-6	21
200	63	7	-9	32
150	59	8	-12	29
100	42	5	-10	11

#85 Grand Cayman (19°N, 81°W)

mb	JAN E/W N/S	APR E/W N/S	JULY E/W N/S	OCT E/W N/S
850	-9	-10	-16	-8
700	-3	-4	-12	-4
500	7	6	-7	-3
300	24	24	-1	-4
200	36	36	6	-7
150	34	32	4	-8
100	16	14	-14	0

#81 Merida (21°N, 90°W)

mb	JAN E/W N/S	APR E/W N/S	JULY E/W N/S	OCT E/W N/S
850	-4	-9	-13	-5
700	2	-3	-11	-4
500	15	8	-8	0
300	30	10	-1	10
200	36	9	3	14
150	36	13	0	13
100	21	8	-14	3

#86 Swan Island (17°N, 84°W)

mb	JAN E/W N/S	APR E/W N/S	JULY E/W N/S	OCT E/W N/S
850	-10	-12	-21	-7
700	-6	-6	-18	-6
500	3	2	-10	-5
300	23	19	0	-3
200	33	30	0	-4
150	30	29	8	-7
100	16	10	-14	-4

#84 Juliana Airfield (18°N, 63°W)

mb	JAN E/W N/S	APR E/W N/S	JULY E/W N/S	OCT E/W N/S
850	-13	-9	-18	-9
700	-8	-2	-14	-6
500	-1	8	-8	-3
300	18	31	5	1
200	31	43	11	7
150	25	36	9	10
100	9	18	-9	2

#87 Kingston (18°N, 77°W)

mb	JAN E/W N/S	APR E/W N/S	JULY E/W N/S	OCT E/W N/S
850	-13	-11	-22	-12
700	-7	-6	-15	-7
500	3	5	-8	-4
300	25	24	3	0
200	39	37	13	7
150	36	36	11	-6
100	15	15	-9	-1

\* Speed is in knots; winds from the west and south are positive



Table 2. Climatic Mean Monthly Observed East-West and North-South Winds\* (Cont.)

#88 San Juan (18°N, 66°W)

mb	JAN	APR	JULY	OCT
E/W N/S	E/W N/S	E/W N/S	E/W N/S	E/W N/S
850	-13	-9	-18	-10
700	-8	-3	-14	-6
500	1	8	-8	-3
300	24	32	4	2
200	39	47	11	8
150	35	44	9	11
100	15	22	-9	2

#115 Nord (82°N, 17°W)

mb	JAN	APR	JULY	OCT
E/W N/S	E/W N/S	E/W N/S	E/W N/S	E/W N/S
850	5	3	3	4
700	8	4	3	6
500	14	10	3	9
300	15	15	5	15
200	15	14	2	16
150	16	13	1	18
100	14	13	-1	18

#89 Raizet (16°N, 62°W)

mb	JAN	APR	JULY	OCT
E/W N/S	E/W N/S	E/W N/S	E/W N/S	E/W N/S
850	-16	-12	-18	-11
700	-10	-4	-18	-9
500	0	7	-9	-3
300	18	30	1	5
200	28	44	10	7
150	25	38	9	10
100	7	17	-12	4

#122 Keflavik (64°N, 23°W)

mb	JAN	APR	JULY	OCT
E/W N/S	E/W N/S	E/W N/S	E/W N/S	E/W N/S
850	-2	8	5	0
700	4	9	5	7
500	9	10	10	16
300	18	12	17	27
200	21	12	16	28
150	24	11	12	24
100	28	9	5	20

#90 Dr. A. Plesman AP (12°N, 65°W)

mb	JAN	APR	JULY	OCT
E/W N/S	E/W N/S	E/W N/S	E/W N/S	E/W N/S
850	-18	-15	-20	-12
700	-12	-6	-19	-10
500	-6	0	-14	-6
300	13	15	-2	3
200	28	23	7	11
150	23	24	10	14
100	7	11	-6	6

#124 Jan Mayen (71°N, 8°W)

mb	JAN	APR	JULY	OCT
E/W N/S	E/W N/S	E/W N/S	E/W N/S	E/W N/S
850	2	2	0	3
700	6	3	2	10
500	14	14	4	19
300	25	1	7	28
200	28	0	6	29
150	31	-1	5	28
100	36	-2	2	27

\* Speed is in knots; winds from the west and south are positive



Table 2. Climatic Mean Monthly Observed East-West and North-South Winds\* (Cont.)

#125 Bjornoya (75°N, 19°E)

mb	JAN E/W N/S	APR E/W N/S	JULY E/W N/S	OCT E/W N/S
850	6	2	4	3
700	12	6	7	11
500	20	13	10	17
300	27	18	14	26
200	28	19	11	26
150	29	19	7	26
100	31	18	4	26

#128 Lerwick (60°N, 1°W)

mb	JAN E/W N/S	APR E/W N/S	JULY E/W N/S	OCT E/W N/S
850	6	5	9	12
700	10	9	12	18
500	16	13	16	26
300	25	19	23	38
200	28	17	20	36
150	28	14	14	30
100	31	12	7	23

#126 Valentia Observatory (52°N, 10°W)

850	11	12	10	-2	10	0	10	7
700	15	7	11	-4	15	-1	15	7
500	20	6	15	-7	20	-2	20	7
300	29	2	21	-12	28	-5	28	7
200	28	2	20	-11	27	-6	28	3
150	24	1	14	-8	20	-3	23	2
100	24	0	8	-7	12	0	15	1

#129 Crawley (51°N, 0°W)

850	8	2	6	-3	8	0	8	3
700	12	0	10	-3	12	0	12	3
500	16	-3	15	-6	18	-1	17	3
300	23	-8	21	-9	26	-1	23	2
200	26	-10	18	-10	26	-2	24	-1
150	24	-8	14	-7	21	0	21	-4
100	24	-8	11	-5	11	1	16	-4

#127 Long Kesh (54°N, 6°W)

850	9	6	7	-3	12	0	13	5
700	12	5	9	-4	14	0	17	6
500	17	2	14	-7	20	-1	23	6
300	26	0	20	-11	28	-3	32	5
200	29	-2	18	-10	26	-2	33	3
150	27	-1	14	-8	20	0	26	1
100	27	-3	10	-6	10	1	19	0

#130 Jaegersborg (56°N, 13°E)

850	5	2	6	0	9	2	22	-5
700	8	-1	9	0	10	4	18	-2
500	11	-4	14	0	14	4	24	-6
300	17	-9	20	-2	20	5	32	-11
200	20	-11	16	-3	20	4	31	-11
150	21	-11	13	-2	14	4	25	-8
100	23	-11	10	-2	7	4	19	-6

\* Speed is in knots; winds from the west and south are positive

Table 2. Climatic Mean Monthly Observed East-West and North-South Winds\* (Cont.)

#131 Bodo (67°N, 14°E)

mb	JAN E/W N/S	APR E/W N/S	JULY E/W N/S	OCT E/W N/S
850	8	3	7	12
700	14	9	9	18
500	19	14	12	27
300	27	18	16	36
200	28	18	13	34
150	31	18	10	31
100	37	18	5	30

#136 Stockholm (59°N, 18°E)

mb	JAN E/W N/S	APR E/W N/S	JULY E/W N/S	OCT E/W N/S
850	5	3	6	14
700	7	7	7	19
500	13	13	12	27
300	19	20	20	39
200	21	17	17	36
150	23	14	13	30
100	27	13	6	23

#132 Orlandet (64°N, 10°E)

mb	JAN E/W N/S	APR E/W N/S	JULY E/W N/S	OCT E/W N/S
850	9	3	8	15
700	13	9	10	19
500	17	12	12	27
300	22	14	17	32
200	24	16	14	30
150	26	15	11	28
100	30	14	7	26

#137 Göteborg (58°N, 12°E)

mb	JAN E/W N/S	APR E/W N/S	JULY E/W N/S	OCT E/W N/S
850	4	3	7	13
700	6	8	10	17
500	11	13	13	24
300	17	20	18	32
200	20	17	24	31
150	21	14	12	25
100	25	10	6	20

#133 Oslo/Gardermoen (60°N, 11°E)

mb	JAN E/W N/S	APR E/W N/S	JULY E/W N/S	OCT E/W N/S
850	4	1	2	10
700	8	5	6	16
500	15	11	12	24
300	24	17	19	36
200	25	15	18	35
150	25	14	13	30
100	26	13	8	26

#138 Sodankylä (67°N, 27°E)

mb	JAN E/W N/S	APR E/W N/S	JULY E/W N/S	OCT E/W N/S
850	10	1	4	8
700	12	4	7	12
500	18	8	10	20
300	23	15	14	30
200	27	22	13	30
150	28	20	9	28
100	33	18	5	26

\*Speed is in knots; winds from the west and south are positive

Table 2. Climatic Mean Monthly Observed East-West and North-South Winds\* (Cont.)

#140 Jokioinen (61°N, 23°E)

mb	JAN E/W	JAN N/S	APR E/W	APR N/S	JULY E/W	JULY N/S	OCT E/W	OCT N/S
850	6	1	4	3	4	3	12	-3
700	10	-2	8	3	5	2	15	-5
500	14	-6	14	4	9	3	22	-9
300	21	-13	20	6	15	6	28	-13
200	23	-14	18	2	14	4	29	-15
150	25	-14	16	1	10	3	27	-14
100	29	-17	14	-1	4	2	24	-11

#144 Nancy (49°N, 6°E)

mb	JAN E/W	JAN N/S	APR E/W	APR N/S	JULY E/W	JULY N/S	OCT E/W	OCT N/S
850	8	2	7	2	8	2	7	4
700	10	-2	10	1	12	2	10	2
500	14	-7	13	-2	17	1	14	0
300	19	-12	19	-5	23	0	17	-2
200	21	-12	17	-4	26	0	18	-4
150	21	-11	16	-2	22	1	18	-4
100	22	-9	12	0	12	3	14	-3

#141 Brest/Guipavas (48°N, 4°W)

mb	JAN E/W	JAN N/S	APR E/W	APR N/S	JULY E/W	JULY N/S	OCT E/W	OCT N/S
850	11	4	6	-2	6	-2	7	5
700	15	1	10	-3	11	-1	10	4
500	20	-1	14	-7	18	-1	15	4
300	30	-6	20	-12	26	-2	17	4
200	30	-8	20	-12	29	-2	21	-3
150	26	-6	16	-7	24	0	18	-2
100	23	-6	12	-5	13	1	13	-2

#145 Trappes (49°N, 2°E)

mb	JAN E/W	JAN N/S	APR E/W	APR N/S	JULY E/W	JULY N/S	OCT E/W	OCT N/S
850	8	3	7	-1	6	0	7	3
700	11	0	10	-1	12	1	10	3
500	17	-4	15	-4	18	0	15	2
300	23	-9	22	-9	25	-1	17	0
200	25	-10	20	-7	27	-2	19	-3
150	24	-8	16	-4	23	0	18	-2
100	23	-7	13	-3	14	1	14	-2

#142 Bordeaux/Mérignac (45°N, 1°W)

mb	JAN E/W	JAN N/S	APR E/W	APR N/S	JULY E/W	JULY N/S	OCT E/W	OCT N/S
850	11	-1	8	-1	6	1	6	3
700	13	-4	10	-3	13	1	7	2
500	18	-7	14	-5	19	0	10	1
300	25	-13	20	-10	27	0	13	-1
200	27	-14	22	-10	33	0	14	-4
150	26	-11	19	-5	30	1	14	-3
100	22	-8	14	-3	17	2	12	-2

#146 Nîmes (44°N, 4°E)

mb	JAN E/W	JAN N/S	APR E/W	APR N/S	JULY E/W	JULY N/S	OCT E/W	OCT N/S
850	1	-6	1	-8	2	-7	-2	-2
700	8	-7	7	-6	10	-4	3	0
500	13	-11	14	-8	18	-4	8	-2
300	20	-19	20	-8	26	-4	12	-5
200	22	-18	22	-6	33	-4	14	-6
150	22	-14	20	-4	28	-1	14	-5
100	20	-11	14	-2	12	0	11	-3

\* Speed is in knots; winds from the west and south are positive

Table 2. Climatic Mean Monthly Observed East-West and North-South Winds\* (Cont.)

#148 DeBilt (52°N, 5°E)

mb	JAN E/W	JAN N/S	APR E/W	APR N/S	JULY E/W	JULY N/S	OCT E/W	OCT N/S
850	8	2	7	0	6	2	9	2
700	10	-1	10	1	12	2	13	2
500	14	-3	17	-3	18	1	19	0
300	20	-11	21	-6	24	1	25	-2
200	22	-13	20	-5	24	1	26	-4
150	23	-11	18	-4	19	1	23	-4
100	23	-10	13	-4	10	2	18	-3

#149 Payerne (47°N, 7°E)

mb	JAN E/W	JAN N/S	APR E/W	APR N/S	JULY E/W	JULY N/S	OCT E/W	OCT N/S
850	5	4	4	2	3	1	3	2
700	8	0	8	2	9	4	6	3
500	13	-9	13	-2	15	-2	9	-1
300	19	-15	19	-5	22	-1	10	-3
200	21	-14	20	-5	26	-2	12	-5
150	21	-13	18	-3	25	0	13	-5
100	22	-12	14	-2	15	1	12	-4

#151 Stuttgart/Cannstatt (49°N, 9°E)

mb	JAN E/W	JAN N/S	APR E/W	APR N/S	JULY E/W	JULY N/S	OCT E/W	OCT N/S
850	8	1	7	0	6	1	6	2
700	10	-2	11	1	12	2	9	1
500	13	-7	14	0	15	0	13	-1
300	17	-12	19	-2	21	0	15	-5
200	20	-14	18	-3	23	-1	17	-6
150	20	-12	15	-2	20	1	16	-5
100	21	-10	13	-1	10	2	13	-4

#152 Muenchen/Riem (48°N, 12°E)

mb	JAN E/W	JAN N/S	APR E/W	APR N/S	JULY E/W	JULY N/S	OCT E/W	OCT N/S
850	9	1	8	-1	8	-1	7	1
700	12	-3	12	0	12	-1	10	-2
500	14	-6	15	0	14	-1	11	-3
300	18	-10	21	0	20	-1	14	-7
200	17	-13	21	-3	24	-2	15	-9
150	18	-13	17	-2	21	0	16	-7
100	19	-11	14	-1	11	2	14	-5

#153 Hannover (52°N, 10°E)

mb	JAN E/W	JAN N/S	APR E/W	APR N/S	JULY E/W	JULY N/S	OCT E/W	OCT N/S
850	8	2	9	0	11	1	10	2
700	9	-2	11	-1	13	1	13	0
500	12	-6	16	0	17	2	17	-2
300	18	-12	21	-2	23	2	24	-5
200	20	-12	18	-4	22	2	24	-7
150	20	-11	14	-3	16	3	20	-5
100	23	-11	12	-2	9	3	16	-4

#154 Berlin/Tempelhof (52°N, 13°E)

mb	JAN E/W	JAN N/S	APR E/W	APR N/S	JULY E/W	JULY N/S	OCT E/W	OCT N/S
850	6	0	7	0	9	0	10	0
700	8	-2	11	0	11	1	14	-3
500	11	-5	15	1	14	2	18	-5
300	14	-9	20	1	19	3	22	-8
200	17	-12	19	-1	19	2	22	-9
150	19	-11	13	-1	14	3	20	-7
100	21	-11	11	-1	7	3	15	-5

\* Speed is in knots; winds from the west and south are positive



Table 2. Climatic Mean Monthly Observed East-West and North-South Winds\* (Cont.)

#153 Schleierwig (55°N, 10°E)

mb	JAN		APR		JULY		OCT	
	E/W	N/S	E/W	N/S	E/W	N/S	E/W	N/S
850	9	6	7	0	10	2	12	2
700	7	-1	10	0	12	2	16	0
500	13	1	15	-1	16	3	22	-2
300	16	-6	20	-3	23	5	31	-6
200	22	-10	27	-4	28	4	30	-7
150	18	-9	15	-3	15	4	24	-5
100	27	-9	11	-3	8	3	19	-5

#163 Poprad (49°N, 20°E)

mb	JAN		APR		JULY		OCT	
	E/W	N/S	E/W	N/S	E/W	N/S	E/W	N/S
850	6	2	4	2	2	-1	7	2
700	6	-1	3	3	6	-1	8	-2
500	11	-4	12	4	8	-2	11	-3
300	14	-3	16	4	11	-2	13	-5
200	15	-6	17	2	16	-1	13	-7
150	15	-7	14	2	16	4	14	-6
100	18	-8	12	2	9	4	14	-4

#156 Erden (53°N, 7°E)

mb	JAN		APR		JULY		OCT	
	E/W	N/S	E/W	N/S	E/W	N/S	E/W	N/S
850	7	2	7	0	10	2	11	2
700	8	-1	10	-1	13	2	14	2
500	12	-5	15	-2	16	3	20	0
300	20	-9	21	-6	24	3	28	-3
200	20	-11	17	-5	22	3	28	-5
150	21	-10	14	-4	16	3	22	-4
100	23	-9	10	-2	8	3	16	-4

#164 Budapest-Loring (47°N, 19°E)

mb	JAN		APR		JULY		OCT	
	E/W	N/S	E/W	N/S	E/W	N/S	E/W	N/S
850	5	0	4	0	3	-3	6	0
700	7	-1	7	0	6	-3	8	-2
500	10	-4	12	2	9	-3	10	-5
300	15	-6	16	2	12	-3	13	-8
200	20	-10	20	0	19	-2	15	-10
150	22	-11	20	0	20	2	16	-9
100	24	-10	18	0	15	6	17	-7

#161 Wien/Hofe Warte (48°N, 16°E)

mb	JAN		APR		JULY		OCT	
	E/W	N/S	E/W	N/S	E/W	N/S	E/W	N/S
850	7	-1	6	-3	6	-8	7	-2
700	8	-5	8	-2	9	-7	11	-4
500	10	-4	12	2	11	-4	12	-4
300	16	-11	19	2	16	-4	15	-8
200	17	-12	18	0	23	-2	17	-10
150	20	-12	16	0	22	2	17	-7
100	22	-11	14	0	11	4	14	-5

#167 North Front (36°N, 5°W)

mb	JAN		APR		JULY		OCT	
	E/W	N/S	E/W	N/S	E/W	N/S	E/W	N/S
850	9	0	4	-1	0	3	1	3
700	14	-3	11	-1	14	8	10	3
500	20	-7	16	-3	22	10	14	0
300	30	-13	30	-4	31	7	22	-1
200	39	-12	37	-4	39	7	27	-3
150	38	-9	36	-2	34	7	24	-3
100	31	-6	26	-1	14	4	16	-1

\*Speed is in knots; winds from the west and south are positive

Table 2. Climatic Mean Monthly Observed East-West and North-South Winds\* (Cont.)

#174 Udine/Campoformido (46°N, 13°E)

mb	JAN E/W N/S	APR E/W N/S	JULY E/W N/S	OCT E/W N/S
850	0	4	0	0
700	7	7	7	-4
500	14	16	18	5
300	22	17	29	11
200	25	-17	-6	15
150	29	-16	-7	16
100	28	-14	-2	18
		23	3	17

#177 Brindisi (41°N, 18°E)

mb	JAN E/W N/S	APR E/W N/S	JULY E/W N/S	OCT E/W N/S
850	6	7	7	3
700	12	14	14	6
500	24	27	29	16
300	39	46	44	25
200	49	53	63	30
150	46	46	56	29
100	40	34	27	24

#175 Milano/Linate (45°N, 9°E)

mb	JAN E/W N/S	APR E/W N/S	JULY E/W N/S	OCT E/W N/S
850	-1	-1	1	0
700	5	-1	8	-3
500	14	-3	20	-6
300	22	-8	32	-10
200	29	-7	43	-10
150	32	-5	38	-4
100	27	-2	19	0

#178 Cagliari/Elmas (39°N, 9°E)

mb	JAN E/W N/S	APR E/W N/S	JULY E/W N/S	OCT E/W N/S
850	14	11	10	4
700	21	18	20	10
500	27	27	32	15
300	38	39	45	20
200	42	46	54	25
150	40	42	47	25
100	34	32	24	20

#176 Roma/Fiumicino (42°N, 12°E)

mb	JAN E/W N/S	APR E/W N/S	JULY E/W N/S	OCT E/W N/S
850	3	4	8	2
700	9	12	13	6
500	17	-11	27	-10
300	26	-20	41	-11
200	34	-20	55	-7
150	37	-18	50	1
100	35	-15	26	4

#180 Qrendi (36°N, 14°E)

mb	JAN E/W N/S	APR E/W N/S	JULY E/W N/S	OCT E/W N/S
850	11	9	6	5
700	16	18	13	11
500	24	31	21	16
300	38	50	34	23
200	50	62	46	29
150	48	56	43	28
100	38	38	20	22

\* Speed is in knots; winds from the west and south are positive

Table 2. Climatic Mean Monthly Observed East-West and North-South Winds\* (Cont.)

#181 Zagreb (46°N, 16°E)

mb	JAN	APR	JULY	OCT
E/W	E/W	E/W	E/W	E/W
N/S	N/S	N/S	N/S	N/S
850	2	3	0	2
700	5	6	5	4
500	10	11	10	8
300	16	17	16	11
200	18	21	23	14
150	21	20	22	15
100	22	16	13	14

#190 Istanbul/Goztepe (41°N, 29°E)

mb	JAN	APR	JULY	OCT
E/W	E/W	E/W	E/W	E/W
N/S	N/S	N/S	N/S	N/S
850	-3	6	-7	-2
700	6	10	3	2
500	12	14	13	13
300	22	23	38	23
200	33	30	49	29
150	37	29	44	31
100	38	27	28	28

#182 Beograd (45°N, 21°E)

mb	JAN	APR	JULY	OCT
E/W	E/W	E/W	E/W	E/W
N/S	N/S	N/S	N/S	N/S
850	6	4	3	3
700	7	8	6	5
500	10	12	10	8
300	19	20	15	11
200	22	23	24	14
150	24	21	25	15
100	24	18	16	16

#191 Ankara (40°N, 33°E)

mb	JAN	APR	JULY	OCT
E/W	E/W	E/W	E/W	E/W
N/S	N/S	N/S	N/S	N/S
850	0	3	-8	-2
700	10	3	6	5
500	16	15	16	10
300	26	21	43	21
200	42	30	59	29
150	40	30	51	32
100	37	27	31	26

#186 Bucuresti/Baneasa (44°N, 26°E)

mb	JAN	APR	JULY	OCT
E/W	E/W	E/W	E/W	E/W
N/S	N/S	N/S	N/S	N/S
850	2	0	-1	-2
700	6	1	3	-3
500	11	10	8	-4
300	16	16	15	-4
200	19	19	25	3
150	22	19	30	6
100	24	19	24	8

#193 Murmansk (69°N, 33°E)

mb	JAN	APR	JULY	OCT
E/W	E/W	E/W	E/W	E/W
N/S	N/S	N/S	N/S	N/S
850	10	-2	6	8
700	10	-4	8	11
500	15	-8	11	18
300	21	-11	15	29
200	22	-13	14	29
150	22	-13	10	26
100	24	-14	5	25

\* Speed is in knots; winds from the west and south are positive

Table 2. Climatic Mean Monthly Observed East-West and North-South Winds\* (Cont.)

#195 Leningrad (60°N, 30°E)

mb	JAN E/W N/S	APR E/W N/S	JULY E/W N/S	OCT E/W N/S
850	4	7	4	13
700	6	11	6	17
500	10	18	10	21
300	16	28	16	32
200	17	25	14	31
150	19	19	11	27
100	22	16	5	22

#200 Moscow (56°N, 38°E)

mb	JAN E/W N/S	APR E/W N/S	JULY E/W N/S	OCT E/W N/S
850	7	6	4	12
700	10	11	6	16
500	14	16	10	23
300	18	24	15	31
200	20	22	17	30
150	21	21	15	26
100	25	18	8	22

#198 Vologda (59°N, 40°E)

mb	JAN E/W N/S	APR E/W N/S	JULY E/W N/S	OCT E/W N/S
850	7	7	2	10
700	9	11	6	14
500	13	17	17	18
300	18	23	14	23
200	18	23	14	24
150	21	21	13	23
100	24	22	7	20

#203 Kiev (50°N, 30°E)

mb	JAN E/W N/S	APR E/W N/S	JULY E/W N/S	OCT E/W N/S
850	4	3	2	9
700	8	8	5	13
500	12	13	6	17
300	17	16	7	20
200	18	16	6	20
150	20	17	5	21
100	21	16	11	19

#199 Kazan (56°N, 49°E)

mb	JAN E/W N/S	APR E/W N/S	JULY E/W N/S	OCT E/W N/S
850	9	8	4	12
700	11	12	8	15
500	15	18	11	19
300	19	25	15	24
200	20	25	18	23
150	21	23	17	22
100	25	22	12	22

#204 Saratov (52°N, 46°E)

mb	JAN E/W N/S	APR E/W N/S	JULY E/W N/S	OCT E/W N/S
850	5	3	4	11
700	9	7	8	16
500	13	13	10	22
300	16	18	16	28
200	20	20	22	30
150	22	22	24	28
100	22	19	17	28

\*Speed is in knots; winds from the west and south are positive



Table 2. Climatic Mean Monthly Observed East-West and North-South Winds\* (Cont.)

#212 Tobruk (32°N, 24°E)

mb	JAN E/W N/S	APR E/W N/S	JULY E/W N/S	OCT E/W N/S
850	14	-2	5	6
700	20	-2	8	10
500	33	-3	14	18
300	59	-5	34	31
200	78	-2	32	42
150	74	0	27	40
100	55	0	10	28

#218 Malakal (10°N, 32°E)

mb	JAN E/W N/S	APR E/W N/S	JULY E/W N/S	OCT E/W N/S
850	-5	0	1	-4
700	-4	-4	-4	-10
500	-4	-5	-8	-10
300	6	1	-15	-7
200	9	4	-30	-6
150	9	3	-33	-5
100	2	0	-27	-9

#216 Port Sudan (20°N, 37°E)

mb	JAN E/W N/S	APR E/W N/S	JULY E/W N/S	OCT E/W N/S
850	0	-5	8	-9
700	14	7	6	-6
500	30	20	-1	0
300	60	1	-20	14
200	67	5	-26	20
150	60	6	-40	14
100	32	2	-46	2

#220 Dakar-Yoff (15°N, 18°W)

mb	JAN E/W N/S	APR E/W N/S	JULY E/W N/S	OCT E/W N/S
850	-6	-3	-7	-10
700	-1	1	-19	-14
500	12	6	-20	-5
300	36	12	7	12
200	48	4	12	18
150	41	6	-21	22
100	19	5	-24	9

#217 Khartoum (16°N, 33°E)

mb	JAN E/W N/S	APR E/W N/S	JULY E/W N/S	OCT E/W N/S
850	-1	-2	6	-6
700	9	4	-4	-5
500	14	7	-7	-3
300	36	-1	-13	0
200	44	10	-24	2
150	40	4	-32	7
100	22	2	-32	3

#222 Abidjan (5°N, 4°W)

mb	JAN E/W N/S	APR E/W N/S	JULY E/W N/S	OCT E/W N/S
850	-7	-5	2	-8
700	-15	-2	-1	-17
500	-10	0	-3	-10
300	11	5	1	-12
200	24	5	-4	-10
150	23	12	-10	-1
100	3	10	-10	2

\* Speed is in knots; winds from the west and south are positive

Table 2. Climatic Mean Monthly Observed East-West and North-South Winds\* (Cont.)

#226 Fort-Lamy (12°N, 15°E)

mb	JAN		APR		JULY		OCT	
	E/W	N/S	E/W	N/S	E/W	N/S	E/W	N/S
850	-4	-6	-6	-5	0	-1	-6	-4
700	-1	2	-8	-1	-10	-4	-11	-2
500	3	3	-7	1	-11	-3	-8	-1
300	24	4	6	-2	-14	-1	-3	0
200	22	14	13	4	-22	-1	-1	1
150	22	13	12	4	-26	3	9	7
100	13	7	3	4	-30	2	-9	9

#253 Syktyvkar (62°N, 51°E)

mb	JAN		APR		JULY		OCT	
	E/W	N/S	E/W	N/S	E/W	N/S	E/W	N/S
850	8	-3	9	1	3	-3	9	0
700	10	-4	15	1	6	-2	11	-1
500	15	-6	21	-1	11	-3	16	-3
300	17	-8	28	-2	14	0	21	-7
200	21	-8	26	-2	16	-1	22	-8
150	21	-10	24	-4	13	0	22	-9
100	24	-10	22	-6	7	0	20	-8

#250 Naryn-Mar (68°N, 53°E)

mb	JAN		APR		JULY		OCT	
	E/W	N/S	E/W	N/S	E/W	N/S	E/W	N/S
850	7	-5	6	-3	4	-2	7	-1
700	9	-8	10	-3	6	2	10	-3
500	13	-12	18	-6	9	0	16	-6
300	15	-14	26	-8	13	2	19	-8
200	16	-16	24	-10	9	2	21	-10
150	18	-17	20	-11	6	1	21	-10
100	20	-18	18	-12	2	2	19	-11

#256 Verkhhoiansk (68°N, 133°E)

mb	JAN		APR		JULY		OCT	
	E/W	N/S	E/W	N/S	E/W	N/S	E/W	N/S
850	0	1	2	1	0	-3	6	1
700	-1	2	4	2	4	-2	6	0
500	-1	4	9	3	7	-4	11	-2
300	0	7	10	4	12	-6	17	-3
200	2	10	8	3	10	-6	16	-2
150	3	12	6	4	7	-5	14	0
100	9	18	7	7	5	-5	14	1

#252 Turukhansk (66°N, 88°E)

mb	JAN		APR		JULY		OCT	
	E/W	N/S	E/W	N/S	E/W	N/S	E/W	N/S
850	5	1	7	0	2	5	4	6
700	9	-1	9	-2	6	5	7	3
500	12	-5	14	-2	8	8	10	3
300	13	-8	16	-5	10	10	11	2
200	12	-7	17	-4	8	11	11	2
150	15	-5	15	-4	3	12	10	2
100	18	-4	14	-4	4	6	11	2

#257 Tura (64°N, 100°E)

mb	JAN		APR		JULY		OCT	
	E/W	N/S	E/W	N/S	E/W	N/S	E/W	N/S
850	8	-4	8	-1	1	0	12	2
700	9	-5	13	-3	2	1	14	0
500	11	-5	16	-7	5	3	17	1
300	11	-6	18	-5	9	7	24	-5
200	14	-3	20	-4	0	8	23	-1
150	13	-8	17	-5	3	2	19	-3
100	15	-5	17	-6	1	1	15	-1

\*Speed is in knots; winds from the west and south are positive

Table 2. Climatic Mean Monthly Observed East-West and North-South Winds\* (Cont.)

#258 Yakutsk (62°N, 130°E)

mb	JAN E/W	JAN N/S	APR E/W	APR N/S	JULY E/W	JULY N/S	OCT E/W	OCT N/S
850	5	-4	4	0	0	0	8	-5
700	4	-4	6	0	0	0	10	-5
500	6	-4	10	1	4	-2	13	-6
300	6	-2	13	2	12	-6	19	-6
200	5	0	12	2	12	-7	18	-5
150	8	3	11	3	8	-6	17	-4
100	13	9	11	5	2	-4	18	-1

#263 Omsk (55°N, 73°E)

mb	JAN E/W	JAN N/S	APR E/W	APR N/S	JULY E/W	JULY N/S	OCT E/W	OCT N/S
850	12	2	9	0	3	-5	13	5
700	16	0	15	-4	5	-2	19	2
500	21	-1	24	-7	8	-2	25	2
300	27	-4	35	-8	11	-1	31	1
200	30	-3	36	-8	13	-5	32	-1
150	31	-4	34	-7	12	-3	27	2
100	45	-6	31	-7	7	-3	28	-2

#259 MYS Schmidt (69°N, 179°W)

mb	JAN E/W	JAN N/S	APR E/W	APR N/S	JULY E/W	JULY N/S	OCT E/W	OCT N/S
850	-4	1	-	-4	3	0	4	-4
700	-1	6	0	0	5	1	4	-1
500	4	11	4	1	6	1	7	2
300	10	15	8	2	10	0	13	4
200	12	11	9	6	6	-1	14	5
150	16	10	9	8	3	-1	15	6
100	23	11	11	12	1	0	17	7

#264 Kustanay (53°N, 64°E)

mb	JAN E/W	JAN N/S	APR E/W	APR N/S	JULY E/W	JULY N/S	OCT E/W	OCT N/S
850	8	0	6	1	4	-4	14	2
700	12	0	11	0	7	-3	20	2
500	16	-2	17	1	10	-3	23	0
300	22	-5	26	1	13	-3	29	-1
200	25	-5	29	1	18	-4	32	-2
150	28	-4	24	0	20	-7	29	-2
100	31	-4	28	0	18	3	28	-1

#262 Sverdlovsk (57°N, 61°E)

mb	JAN E/W	JAN N/S	APR E/W	APR N/S	JULY E/W	JULY N/S	OCT E/W	OCT N/S
850	12	-2	10	1	4	-3	14	1
700	14	-1	15	1	6	-2	16	2
500	18	-4	21	0	8	-1	20	2
300	24	-6	29	0	11	0	27	3
200	26	-5	28	-1	13	-1	27	1
150	28	-5	28	-1	11	-2	26	-1
100	32	-3	27	-2	7	-1	24	-1

#265 Kolpashev (58°N, 83°E)

mb	JAN E/W	JAN N/S	APR E/W	APR N/S	JULY E/W	JULY N/S	OCT E/W	OCT N/S
850	11	2	12	-5	3	-1	14	3
700	14	0	16	-8	5	-2	18	2
500	18	-3	22	-15	7	-2	24	2
300	22	-6	32	-18	9	0	30	-3
200	24	-6	31	-15	8	-1	30	-5
150	28	-6	30	-15	6	0	27	-5
100	27	-7	28	-15	4	0	25	-5

\* Speed is in knots; winds from the west and south are positive

Table 2. Climatic Mean Monthly Observed East-West and North-South Winds\* (Cont.)

#266 Krasnoyarsk (56°N, 93°E)									
mb	JAN E/W	JAN N/S	APR E/W	APR N/S	JULY E/W	JULY N/S	OCT E/W	OCT N/S	
850	16	5	14	0	1	0	13	4	
700	18	0	20	-2	5	1	16	5	
500	24	-3	26	-6	7	4	18	3	
300	27	-8	33	-10	8	10	28	4	
200	28	-7	31	-9	8	9	27	2	
150	28	-6	27	-9	8	7	25	2	
100	32	-5	24	-8	6	5	24	1	

#267 Kirensk (58°N, 108°E)									
mb	JAN E/W	JAN N/S	APR E/W	APR N/S	JULY E/W	JULY N/S	OCT E/W	OCT N/S	
850	13	0	8	-1	-4	-3	13	0	
700	15	-6	11	-4	-1	-2	16	-3	
500	18	-12	14	-8	1	0	21	-6	
300	19	-12	19	-11	5	3	24	-8	
200	20	-11	18	-8	8	4	23	-7	
150	22	-9	20	-9	6	4	24	-6	
100	26	-6	20	-7	4	1	22	-4	

#268 Chita (52°N, 113°E)									
mb	JAN E/W	JAN N/S	APR E/W	APR N/S	JULY E/W	JULY N/S	OCT E/W	OCT N/S	
850	9	-7	7	-6	0	-1	6	-5	
700	11	-13	11	-9	1	-1	11	-8	
500	16	-16	20	-13	4	-1	18	-11	
300	22	-20	29	-15	10	-1	27	-10	
200	26	-14	29	-13	15	2	29	-11	
150	27	-12	31	-11	15	1	27	-9	
100	30	-5	28	-8	9	-1	27	-5	

#270 Okhotsk (59°N, 143°E)									
mb	JAN E/W	JAN N/S	APR E/W	APR N/S	JULY E/W	JULY N/S	OCT E/W	OCT N/S	
850	-1	-4	-2	-2	-3	3	2	-3	
700	0	-3	2	0	-1	-2	6	-3	
500	1	0	6	3	4	-3	11	-2	
300	3	3	12	6	10	-4	16	1	
200	5	8	12	6	11	-6	18	1	
150	10	13	12	8	10	-6	20	2	
100	14	18	11	10	3	-5	20	4	

#271 Blagoveshchensk (50°N, 128°E)									
mb	JAN E/W	JAN N/S	APR E/W	APR N/S	JULY E/W	JULY N/S	OCT E/W	OCT N/S	
850	5	-10	7	-4	2	5	6	-5	
700	9	-10	10	-3	4	2	11	-5	
500	15	-12	18	-5	10	2	18	-6	
300	21	-11	28	-6	18	3	25	-7	
200	25	-4	31	-5	25	4	28	-4	
150	29	-4	31	-3	22	2	29	-3	
100	32	1	28	-1	12	-1	29	1	

#272 Khabarovsk (49°N, 135°E)									
mb	JAN E/W	JAN N/S	APR E/W	APR N/S	JULY E/W	JULY N/S	OCT E/W	OCT N/S	
350	11	-4	9	1	3	1	9	0	
700	10	-8	14	-1	4	0	13	-1	
500	15	-9	22	-2	9	-1	20	-3	
300	25	-7	32	-2	22	-2	31	0	
200	29	-3	37	0	30	-5	35	4	
150	32	0	30	4	37	-6	35	6	
100	35	2	31	2	13	-5	30	6	

\* Speed is in knots; winds from the west and south are positive



Table 2. Climatic Mean Monthly Observed East-West and North-South Winds\* (Cont.)

#276 Orenburg (52°N, 55°E)

mb	JAN E/W N/S	APR E/W N/S	JULY E/W N/S	OCT E/W N/S
850	6	1	3	12
700	10	-1	7	16
500	13	0	11	20
300	19	-4	16	30
200	23	-7	22	-1
150	23	-4	25	-3
100	27	-2	27	-4
			17	26
			0	-3

#280 Tashkent (41°N, 69°E)

mb	JAN E/W N/S	APR E/W N/S	JULY E/W N/S	OCT E/W N/S
850	2	4	3	3
700	16	6	6	13
500	24	9	16	18
300	36	2	30	33
200	42	-1	37	-2
150	36	0	51	-6
100	39	-3	53	-7
			30	41
			4	-5
			34	-3

#278 Guryev (47°N, 52°E)

mb	JAN E/W N/S	APR E/W N/S	JULY E/W N/S	OCT E/W N/S
850	4	0	3	9
700	8	1	7	15
500	12	0	16	21
300	24	-4	31	29
200	28	-4	54	32
150	29	-2	48	27
100	30	-3	29	27
			0	-1

#282 Hong Kong/King's Park (22°N, 114°E)

mb	JAN E/W N/S	APR E/W N/S	JULY E/W N/S	OCT E/W N/S
850	2	2	3	6
700	20	2	14	4
500	43	3	24	5
300	65	8	42	5
200	68	17	52	1
150	61	18	45	0
100	40	7	22	0
			0	-9
			-13	7
			-34	-3

#279 Alma-Ata (43°N, 77°E)

mb	JAN E/W N/S	APR E/W N/S	JULY E/W N/S	OCT E/W N/S
850	2	1	3	0
700	7	3	7	12
500	26	5	22	19
300	36	7	36	3
200	34	-2	40	3
150	37	-3	38	2
100	35	2	31	3
			35	3
			0	3
			8	4
			21	-1
			31	-3
			37	-3
			39	-3
			35	-2

#284 Wakkanai (45°N, 142°E)

mb	JAN E/W N/S	APR E/W N/S	JULY E/W N/S	OCT E/W N/S
850	10	-5	12	6
700	18	-4	18	10
500	29	-4	32	18
300	47	-1	52	29
200	50	3	57	4
150	51	6	50	30
100	46	7	41	42
			16	60
			35	12
			46	18
			13	16
			2	13
			1	4
			12	12
			16	18
			46	13

\* Speed is in knots; winds from the west and south are positive

Table 2. Climatic Mean Monthly Observed East-West and North-South Winds\* (Cont.)

#285 Sapporo (43°N, 141°E)

mb	JAN E/W	JAN N/S	APR E/W	APR N/S	JULY E/W	JULY N/S	OCT E/W	OCT N/S
850	13	-5	11	0	6	3	12	0
700	23	-5	20	-2	11	-1	18	1
500	39	-2	36	0	20	-3	31	6
300	60	1	61	2	34	-8	57	17
200	63	4	65	3	48	-13	68	22
150	61	6	59	3	39	-12	65	19
100	53	6	44	3	18	-9	48	14

#288 Sendai (38°N, 141°E)

mb	JAN E/W	JAN N/S	APR E/W	APR N/S	JULY E/W	JULY N/S	OCT E/W	OCT N/S
850	20	-4	14	1	9	4	11	1
700	33	-3	24	0	15	0	19	2
500	50	0	39	2	21	-1	37	9
300	84	8	68	5	34	-5	69	23
200	98	8	81	4	42	-12	81	24
150	95	8	72	2	36	-14	77	21
100	72	6	54	2	14	-10	52	14

#286 Nemuro (43°N, 146°E)

mb	JAN E/W	JAN N/S	APR E/W	APR N/S	JULY E/W	JULY N/S	OCT E/W	OCT N/S
850	12	-6	11	-1	6	1	11	1
700	23	-3	20	0	11	-1	19	2
500	40	1	36	2	20	-4	34	7
300	61	5	61	5	34	-8	63	20
200	63	6	66	4	46	-13	75	24
150	60	6	57	4	36	-13	67	20
100	50	8	43	3	16	-9	48	13

#289 Wajima (37°N, 137°E)

mb	JAN E/W	JAN N/S	APR E/W	APR N/S	JULY E/W	JULY N/S	OCT E/W	OCT N/S
850	16	-1	12	3	12	7	8	2
700	28	0	20	0	16	4	17	2
500	53	-3	40	-1	21	1	37	6
300	92	2	69	1	32	-2	69	17
200	104	8	82	1	39	-9	84	21
150	95	7	73	1	33	-12	76	17
100	74	6	54	1	11	-10	53	12

#287 Akita (40°N, 140°E)

mb	JAN E/W	JAN N/S	APR E/W	APR N/S	JULY E/W	JULY N/S	OCT E/W	OCT N/S
850	20	-1	19	6	10	6	12	2
700	33	0	26	1	16	2	21	2
500	52	-2	42	1	22	-1	38	6
300	80	2	62	3	37	-5	68	20
200	86	7	79	4	48	-12	82	25
150	85	8	71	3	41	-14	74	20
100	71	6	54	2	18	-10	52	13

#290 Tateno (36°N, 140°E)

mb	JAN E/W	JAN N/S	APR E/W	APR N/S	JULY E/W	JULY N/S	OCT E/W	OCT N/S
850	14	-1	6	3	2	4	3	0
700	27	-2	18	1	12	0	16	3
500	58	1	41	1	18	-1	39	10
300	103	8	71	5	27	-5	70	22
200	122	9	86	3	33	-13	83	22
150	91	12	78	2	29	-15	76	20
100	79	6	56	2	9	-11	50	13

\* Speed is in knots; winds from the west and south are positive

Table 2. Climatic Mean Monthly Observed East-West and North-South Winds\* (Cont.)

#291 Hachiojima (33°N, 140°E)

mb	JAN	APR	JULY	OCT
E/W	N/S	E/W	N/S	E/W
N/S	E/W	N/S	E/W	N/S
850	19	10	11	2
700	35	21	13	14
500	66	40	14	35
300	116	65	15	56
200	136	81	16	69
150	123	77	14	63
100	83	53	-1	41

#294 Fukuoka (34°N, 130°E)

mb	JAN	APR	JULY	OCT
E/W	N/S	E/W	N/S	E/W
N/S	E/W	N/S	E/W	N/S
850	12	6	9	3
700	29	18	12	14
500	59	38	15	36
300	110	66	19	66
200	132	83	22	80
150	120	78	18	74
100	86	55	1	48

#292 Yonago (35°N, 133°E)

mb	JAN	APR	JULY	OCT
E/W	N/S	E/W	N/S	E/W
N/S	E/W	N/S	E/W	N/S
850	15	7	10	4
700	29	19	14	15
500	59	40	18	36
300	102	69	25	69
200	122	86	30	83
150	106	78	26	77
100	83	56	6	51

#295 Nagashima (32°N, 131°E)

mb	JAN	APR	JULY	OCT
E/W	N/S	E/W	N/S	E/W
N/S	E/W	N/S	E/W	N/S
850	14	10	6	1
700	32	20	10	14
500	62	38	11	32
300	116	62	11	60
200	136	79	9	69
150	123	76	7	64
100	81	51	-6	39

#293 Shionomisaki (33°N, 136°E)

mb	JAN	APR	JULY	OCT
E/W	N/S	E/W	N/S	E/W
N/S	E/W	N/S	E/W	N/S
850	17	6	7	0
700	33	20	12	15
500	64	32	15	36
300	117	68	18	65
200	140	83	18	77
150	129	81	15	71
100	92	58	0	48

#296 Naze (29°N, 130°E)

mb	JAN	APR	JULY	OCT
E/W	N/S	E/W	N/S	E/W
N/S	E/W	N/S	E/W	N/S
850	10	13	2	8
700	29	20	3	5
500	63	34	3	26
300	112	56	0	45
200	123	71	-3	51
150	113	68	-7	48
100	81	45	-15	29

\* Speed is in knots; winds from the west and south are positive

Table 2. Climatic Mean Monthly Observed East-West and North-South Winds\* (Cont.)

#299 Aleppo (36°N, 37°E)

mb	JAN E/W N/S	APR E/W N/S	JULY E/W N/S	OCT E/W N/S
850	0 3	6 2	12 -8	3 3
700	10 5	11 4	6 1	7 7
500	20 4	20 4	16 4	19 9
300	39 5	35 4	37 17	34 17
200	56 8	46 4	43 24	46 21
150	57 8	44 5	41 25	48 20
100	47 5	36 6	26 20	36 14

#303 Muharraq (26°N, 51°E)

mb	JAN E/W N/S	APR E/W N/S	JULY E/W N/S	OCT E/W N/S
850	9 -1	10 -1	6 -16	3 -6
700	21 1	18 1	3 -6	2 -4
500	45 1	30 4	-7 0	10 1
300	80 2	53 6	-12 -2	31 5
200	98 0	73 7	-17 2	41 9
150	87 0	66 4	-24 3	38 10
100	64 2	40 8	-36 3	20 6

#300 Beyrouth/Khaldeh (34°N, 35°E)

mb	JAN E/W N/S	APR E/W N/S	JULY E/W N/S	OCT E/W N/S
850	6 6	6 5	4 -1	3 4
700	13 4	15 4	10 0	9 5
500	27 4	29 3	16 8	20 7
300	52 3	51 2	30 13	40 10
200	71 5	66 3	28 18	50 16
150	69 4	66 0	23 19	46 16
100	52 3	33 3	9 18	31 12

#309 New Delhi/Safdarjung (29°N, 77°E)

mb	JAN E/W N/S	APR E/W N/S	JULY E/W N/S	OCT E/W N/S
850	8 -4	10 -5	3 -1	6 -5
700	14 -2	16 -4	2 -4	9 -8
500	37 -1	25 -3	1 -1	17 -5
300	77 1	44 -3	0 2	46 0
200	92 6	59 -1	-3 4	57 8
150	85 5	54 0	-6 3	50 8
100	56 4	30 1	-18 -3	27 2

#302 Mafrag Ap (32°N, 36°E)

mb	JAN E/W N/S	APR E/W N/S	JULY E/W N/S	OCT E/W N/S
850	8 6	9 1	13 -7	5 2
700	16 4	17 3	12 2	10 10
500	34 3	29 3	16 5	22 11
300	61 5	52 2	23 13	42 17
200	84 6	68 1	23 17	56 22
150	83 5	65 4	20 21	57 20
100	64 4	49 2	7 18	43 17

#323 Chiang Mai (19°N, 99°E)

mb	JAN E/W N/S	APR E/W N/S	JULY E/W N/S	OCT E/W N/S
850	2 4	6 1	8 1	-5 3
700	12 0	7 1	11 1	-6 2
500	26 -2	19 -1	1 2	-2 3
300	47 6	35 2	-16 -4	-1 3
200	50 15	41 7	-31 -8	0 1
150	44 14	33 3	-43 -10	-5 4
100	28 6	16 0	-59 -12	-12 3

\* Speed is in knots; winds from the west and south are positive



Table 2. Climatic Mean Monthly Observed East-West and North-South Winds\* (Cont.)

#324 Ubon Ratchathani (15°N, 105°E)

mb	JAN E/W N/S	APR E/W N/S	JULY E/W N/S	OCT E/W N/S
850	0	0	11	-8
700	4	0	11	-8
500	8	7	1	-11
300	14	13	-11	-12
200	21	19	-23	-12
150	13	16	-40	-17
100	6	1	-52	-22

#327 Singapore (1°N, 104°E)

mb	JAN E/W N/S	APR E/W N/S	JULY E/W N/S	OCT E/W N/S
850	2	0	6	4
700	2	-2	6	3
500	-2	-5	-6	-5
300	-11	-9	-17	-12
200	-19	-8	-34	-20
150	-23	-6	-40	-28
100	-8	-8	-13	-12

#325 Bangkok (14°N, 100°E)

mb	JAN E/W N/S	APR E/W N/S	JULY E/W N/S	OCT E/W N/S
850	-5	0	13	-3
700	-1	-4	12	-2
500	0	3	4	0
300	9	9	-8	-4
200	11	12	-25	-9
150	12	16	-40	-13
100	3	-1	-52	-11

#329 Saigon/Tan-Son-Nhut (11°N, 107°E)

mb	JAN E/W N/S	APR E/W N/S	JULY E/W N/S	OCT E/W N/S
850	-7	-4	0	14
700	-8	-1	-8	10
500	-6	-1	-5	1
300	-3	3	2	-11
200	-1	12	7	-24
150	-7	16	6	-36
100	-9	5	-6	-42

#326 Sonkhla (7°N, 101°E)

mb	JAN E/W N/S	APR E/W N/S	JULY E/W N/S	OCT E/W N/S
850	-15	-3	14	2
700	-7	0	13	-2
500	-11	0	2	4
300	-10	4	-15	-5
200	-10	12	-32	-9
150	-13	12	-44	-9
100	-12	5	-38	-5

#351 Lihue, Kauai (22°N, 159°W)

mb	JAN E/W N/S	APR E/W N/S	JULY E/W N/S	OCT E/W N/S
850	-1	0	-10	-3
700	6	1	-3	0
500	20	-1	10	1
300	44	-8	32	2
200	57	-12	57	5
150	51	-11	55	6
100	32	-6	31	3

\* Speed is in knots; winds from the west and south are positive

Table 2. Climatic Mean Monthly Observed East-West and North-South Winds\* (Cont.)

#352 Hilo/Gen. Lyman (20°N, 155°W)

mb	JAN E/W	JAN N/S	APR E/W	APR N/S	JULY E/W	JULY N/S	OCT E/W	OCT N/S
850	-2	3	-7	0	-8	-1	-6	0
700	3	2	-2	-1	-8	1	-4	-1
500	16	0	11	0	2	2	1	-1
300	40	-3	41	0	22	4	18	0
200	50	-8	67	-2	36	4	29	2
150	43	-11	62	-6	32	5	25	1
100	24	-6	32	-2	0	4	9	0

#355 Guam (14°N, 145°E)

mb	JAN E/W	JAN N/S	APR E/W	APR N/S	JULY E/W	JULY N/S	OCT E/W	OCT N/S
850	-17	-2	-15	-1	-7	3	-8	1
700	-11	0	-10	-2	-8	2	-8	1
500	-10	2	-6	-3	-8	1	-10	-1
300	-3	1	9	-2	-7	-1	-5	0
200	1	6	15	6	-6	-4	-2	1
150	-1	8	13	5	-7	-8	-5	-1
100	-12	9	-2	-1	-19	-5	-19	-1

#353 Wake Island (19°N, 167°E)

mb	JAN E/W	JAN N/S	APR E/W	APR N/S	JULY E/W	JULY N/S	OCT E/W	OCT N/S
850	-8	-2	-14	-1	-14	2	-13	1
700	2	-3	-7	-2	-11	1	-11	1
500	14	-5	3	-5	-5	0	-10	-1
300	28	-9	28	-8	-6	-3	-3	-2
200	31	-8	44	-9	14	-4	5	-3
150	28	-5	42	-9	15	-6	1	-5
100	16	-1	17	-6	-9	-4	-11	-4

#356 Majuro (7°N, 171°E)

mb	JAN E/W	JAN N/S	APR E/W	APR N/S	JULY E/W	JULY N/S	OCT E/W	OCT N/S
850	-16	-4	-15	0	-12	2	-8	2
700	-11	-1	-8	1	-13	1	-8	1
500	-16	-3	-2	1	-13	0	-8	0
300	-5	-3	9	3	-9	2	-3	-1
200	-3	5	15	6	-2	2	2	-2
150	-5	2	16	1	4	0	5	-1
100	-15	-5	9	-3	-3	1	-3	-2

#354 Johnston Island (17°N, 170°W)

mb	JAN E/W	JAN N/S	APR E/W	APR N/S	JULY E/W	JULY N/S	OCT E/W	OCT N/S
850	-9	-2	-11	-1	-18	-1	-13	0
700	-1	-1	-2	-1	-10	0	-7	1
500	10	-5	9	-1	0	1	-4	0
300	30	-10	37	-1	21	3	15	1
200	36	-11	56	2	35	5	30	3
150	32	-11	52	-2	35	5	25	0
100	16	-9	28	-5	2	2	4	-2

#357 Truk (7°N, 152°E)

mb	JAN E/W	JAN N/S	APR E/W	APR N/S	JULY E/W	JULY N/S	OCT E/W	OCT N/S
850	-16	-3	-12	-1	-4	1	-2	2
700	-14	-1	-8	0	-8	1	-5	1
500	-21	1	-8	-1	-11	1	-7	0
300	-14	1	-4	3	-9	0	-6	-1
200	-12	7	-2	8	-10	-4	-7	-4
150	-16	6	-1	3	-9	-6	-6	-6
100	-25	3	-5	-3	-8	-2	-13	-3

\* Speed is in knots; winds from the west and south are positive

Table 2. Climatic Mean Monthly Observed East-West and North-South Winds\* (Cont.)

#375 Goree ( $6^{\circ}\text{N}$ ,  $134^{\circ}\text{E}$ )

mo	E/W	N/S	E/W	N/S	E/W	N/S	E/W	N/S
4:00	<1.0	<1.0	<1.0	<1.0	1.0	1.0	1.0	1.0
5:00	<1.0	<1.0	<1.0	<1.0	1.0	1.0	1.0	1.0
6:00	<1.0	<1.0	<1.0	<1.0	1.0	1.0	1.0	1.0
7:00	<1.0	<1.0	<1.0	<1.0	1.0	1.0	1.0	1.0
8:00	<1.0	<1.0	<1.0	<1.0	1.0	1.0	1.0	1.0
9:00	<1.0	<1.0	<1.0	<1.0	1.0	1.0	1.0	1.0
10:00	<1.0	<1.0	<1.0	<1.0	1.0	1.0	1.0	1.0
11:00	<1.0	<1.0	<1.0	<1.0	1.0	1.0	1.0	1.0

#375 Bongo ( $6^{\circ}\text{N}$ ,  $134^{\circ}\text{E}$ )

mo	E/W	N/S	E/W	N/S	E/W	N/S	E/W	N/S
4:00	<1.0	<1.0	<1.0	<1.0	1.0	1.0	1.0	1.0
5:00	<1.0	<1.0	<1.0	<1.0	1.0	1.0	1.0	1.0
6:00	<1.0	<1.0	<1.0	<1.0	1.0	1.0	1.0	1.0
7:00	<1.0	<1.0	<1.0	<1.0	1.0	1.0	1.0	1.0
8:00	<1.0	<1.0	<1.0	<1.0	1.0	1.0	1.0	1.0
9:00	<1.0	<1.0	<1.0	<1.0	1.0	1.0	1.0	1.0
10:00	<1.0	<1.0	<1.0	<1.0	1.0	1.0	1.0	1.0
11:00	<1.0	<1.0	<1.0	<1.0	1.0	1.0	1.0	1.0

#375 Yag ( $10^{\circ}\text{N}$ ,  $134^{\circ}\text{E}$ )

mo	E/W	N/S	E/W	N/S	E/W	N/S	E/W	N/S
4:00	<1.0	<1.0	<1.0	<1.0	1.0	1.0	1.0	1.0
5:00	<1.0	<1.0	<1.0	<1.0	1.0	1.0	1.0	1.0
6:00	<1.0	<1.0	<1.0	<1.0	1.0	1.0	1.0	1.0
7:00	<1.0	<1.0	<1.0	<1.0	1.0	1.0	1.0	1.0
8:00	<1.0	<1.0	<1.0	<1.0	1.0	1.0	1.0	1.0
9:00	<1.0	<1.0	<1.0	<1.0	1.0	1.0	1.0	1.0
10:00	<1.0	<1.0	<1.0	<1.0	1.0	1.0	1.0	1.0
11:00	<1.0	<1.0	<1.0	<1.0	1.0	1.0	1.0	1.0

#375 Ship Alpha ( $12^{\circ}\text{N}$ ,  $134^{\circ}\text{W}$ )

mo	E/W	N/S	E/W	N/S	E/W	N/S	E/W	N/S
4:00	<1.0	<1.0	<1.0	<1.0	1.0	1.0	1.0	1.0
5:00	<1.0	<1.0	<1.0	<1.0	1.0	1.0	1.0	1.0
6:00	<1.0	<1.0	<1.0	<1.0	1.0	1.0	1.0	1.0
7:00	<1.0	<1.0	<1.0	<1.0	1.0	1.0	1.0	1.0
8:00	<1.0	<1.0	<1.0	<1.0	1.0	1.0	1.0	1.0
9:00	<1.0	<1.0	<1.0	<1.0	1.0	1.0	1.0	1.0
10:00	<1.0	<1.0	<1.0	<1.0	1.0	1.0	1.0	1.0
11:00	<1.0	<1.0	<1.0	<1.0	1.0	1.0	1.0	1.0

#375 Ship Bravo ( $12^{\circ}\text{N}$ ,  $134^{\circ}\text{W}$ )

mo	E/W	N/S	E/W	N/S	E/W	N/S	E/W	N/S
4:00	<1.0	<1.0	<1.0	<1.0	1.0	1.0	1.0	1.0
5:00	<1.0	<1.0	<1.0	<1.0	1.0	1.0	1.0	1.0
6:00	<1.0	<1.0	<1.0	<1.0	1.0	1.0	1.0	1.0
7:00	<1.0	<1.0	<1.0	<1.0	1.0	1.0	1.0	1.0
8:00	<1.0	<1.0	<1.0	<1.0	1.0	1.0	1.0	1.0
9:00	<1.0	<1.0	<1.0	<1.0	1.0	1.0	1.0	1.0
10:00	<1.0	<1.0	<1.0	<1.0	1.0	1.0	1.0	1.0
11:00	<1.0	<1.0	<1.0	<1.0	1.0	1.0	1.0	1.0

#375 Ship Charlie ( $12^{\circ}\text{N}$ ,  $134^{\circ}\text{W}$ )

mo	E/W	N/S	E/W	N/S	E/W	N/S	E/W	N/S
4:00	<1.0	<1.0	<1.0	<1.0	1.0	1.0	1.0	1.0
5:00	<1.0	<1.0	<1.0	<1.0	1.0	1.0	1.0	1.0
6:00	<1.0	<1.0	<1.0	<1.0	1.0	1.0	1.0	1.0
7:00	<1.0	<1.0	<1.0	<1.0	1.0	1.0	1.0	1.0
8:00	<1.0	<1.0	<1.0	<1.0	1.0	1.0	1.0	1.0
9:00	<1.0	<1.0	<1.0	<1.0	1.0	1.0	1.0	1.0
10:00	<1.0	<1.0	<1.0	<1.0	1.0	1.0	1.0	1.0
11:00	<1.0	<1.0	<1.0	<1.0	1.0	1.0	1.0	1.0

\* Speed is in knots; winds from the west and south are positive

Table 2. Climatic Mean Monthly Observed East-West and North-South Winds\* (Cont.)

#376 Ship Delta (44°N, 41°W)

mb	JAN		APR		JULY		OCT	
	E/W	N/S	E/W	N/S	E/W	N/S	E/W	N/S
850	20	4	17	12	15	5	16	1
700	27	6	22	12	17	2	21	0
500	30	11	30	18	23	1	30	0
300	32	10	42	15	27	-2	42	1
200	47	5	43	12	26	-5	45	-2
150	43	3	31	8	22	-5	36	-2
100	36	2	20	3	10	0	21	0

#373 Ship Juliet (52°N, 20°W)

mb	JAN		APR		JULY		OCT	
	E/W	N/S	E/W	N/S	E/W	N/S	E/W	N/S
850	11	0	8	1	14	-1	14	2
700	15	10	10	1	16	-1	17	7
500	20	12	14	0	24	-2	24	8
300	30	14	22	-1	32	-4	34	6
200	31	10	20	-3	31	-6	35	3
150	29	9	16	-3	23	-3	28	2
100	24	7	11	-2	12	-1	20	1

#377 Ship Echo (55°N, 40°W)

mb	JAN		APR		JULY		OCT	
	E/W	N/S	E/W	N/S	E/W	N/S	E/W	N/S
850	17	2	17	7	7	0	6	4
700	20	0	21	7	4	-1	10	0
500	45	-5	30	8	6	-3	15	-1
300	64	-8	40	10	4	-6	23	-1
200	71	-7	52	7	1	-4	28	-4
150	68	-6	44	4	1	-6	22	-6
100	46	-6	29	2	-1	-4	15	-5

#331 Ship Mike (56°N, 2°E)

mb	JAN		APR		JULY		OCT	
	E/W	N/S	E/W	N/S	E/W	N/S	E/W	N/S
850	8	4	4	-2	5	4	10	2
700	12	4	7	-2	7	6	16	2
500	18	2	12	-4	12	8	24	1
300	26	-1	17	-6	16	9	37	-1
200	31	-3	17	-7	16	8	38	-3
150	30	-7	15	-6	13	6	32	-2
100	23	-8	13	-7	7	6	26	-4

#378 Ship India (59°N, 10°W)

mb	JAN		APR		JULY		OCT	
	E/W	N/S	E/W	N/S	E/W	N/S	E/W	N/S
850	5	8	0	2	12	1	11	7
700	7	9	11	2	13	0	15	8
500	13	11	18	2	21	0	23	11
300	23	14	25	1	30	-2	34	12
200	25	10	22	-1	26	-3	35	10
150	26	10	18	-2	19	-1	29	8
100	25	7	14	-2	10	0	21	4

#332 Ship November (56°N, 140°W)

mb	JAN		APR		JULY		OCT	
	E/W	N/S	E/W	N/S	E/W	N/S	E/W	N/S
850	2	7	-1	2	-6	-3	5	6
700	8	5	4	-1	-4	-2	1	1
500	18	5	12	-2	2	1	8	1
300	37	4	23	-1	14	3	17	1
200	32	-1	22	-1	21	9	24	0
150	46	-4	36	1	19	12	23	2
100	34	-6	26	0	5	8	14	2

\* Speed is in knots; winds from the west and south are positive



Table 2. Climatic Mean Monthly Observed East-West and North-South Winds\* (Cont.)

#385 San Andres (13°N, 82°W)

mb	JAN E/W	JAN N/S	APR E/W	APR N/S	JULY E/W	JULY N/S	OCT E/W	OCT N/S
850	-17	-7	-14	-4	-21	-2	-9	-2
700	-11	-2	-9	-2	-17	1	-6	1
500	-6	1	-4	-1	-14	5	-8	1
300	18	7	10	-1	-3	-1	-6	-2
200	26	16	18	6	4	-2	-3	-3
150	25	12	17	3	4	-3	-4	-3
100	5	6	1	-2	-10	-1	-3	-1

#386 Bogota (5°N, 74°W)

mb	JAN E/W	JAN N/S	APR E/W	APR N/S	JULY E/W	JULY N/S	OCT E/W	OCT N/S
850	-6	-2	-5	1	-9	4	-5	1
700	-8	0	-6	1	-13	4	-4	1
500	6	4	-2	4	-14	0	-3	-1
300	14	12	1	8	-6	-11	-3	-2
150	20	5	10	3	1	-6	2	1
100	2	-3	-1	-1	-3	1	3	0

#390 Uccle (51°N, 4°E)

mb	JAN E/W	JAN N/S	APR E/W	APR N/S	JULY E/W	JULY N/S	OCT E/W	OCT N/S
850	11	3	7	-1	10	1	8	2
700	12	0	10	-2	12	1	11	1
500	16	-4	14	-4	18	1	15	-1
300	23	-9	20	-6	24	0	20	-3
200	23	-13	18	-9	23	0	21	-7
150	23	-11	16	-4	20	0	22	-7
100	24	-9	12	-4	12	1	16	-5

#416 Kwajalein (9°N, 168°E)

mb	JAN E/W	JAN N/S	APR E/W	APR N/S	JULY E/W	JULY N/S	OCT E/W	OCT N/S
850	-16	-4	-14	0	-13	0	-9	0
700	-13	-2	-7	0	-13	1	-10	0
500	-17	-4	-2	-1	-12	1	-7	0
300	-7	-4	10	2	-5	2	-2	0
200	-4	5	17	6	1	2	3	-1
150	-6	5	18	1	6	0	6	-1
100	-16	-3	6	-5	-3	1	-5	-1

#417 Chihuahua (29°N, 106°W)

mb	JAN E/W	JAN N/S	APR E/W	APR N/S	JULY E/W	JULY N/S	OCT E/W	OCT N/S
850	-1	0	2	2	-2	-1	-2	1
700	12	3	12	7	-3	1	5	4
500	26	3	29	9	-8	0	14	4
300	44	0	48	11	-8	0	30	6
200	44	-1	55	12	-8	-2	36	8
150	41	2	53	11	-10	-3	35	7
100	32	1	38	9	-14	-2	17	2

#422 Empalme (28°N, 111°W)

mb	JAN E/W	JAN N/S	APR E/W	APR N/S	JULY E/W	JULY N/S	OCT E/W	OCT N/S
850	2	0	3	1	-2	-1	-1	0
700	9	0	12	5	-6	0	3	5
500	22	1	29	8	-8	3	12	2
300	43	2	52	13	-10	6	31	5
200	58	4	68	16	-11	3	42	8
150	50	2	62	14	-14	2	37	7
100	36	3	39	10	-16	2	20	2

\* Speed is in knots; winds from the west and south are positive

Table 2. Climatic Mean Monthly Observed East-West and North-South Winds\* (Cont.)

#439 Essen (51°N, 7°E)

mb	JAN		APR		JULY		OCT	
	E/W	N/S	E/W	N/S	E/W	N/S	E/W	N/S
850	9	3	9	1	8	2	10	3
700	9	-1	11	0	10	1	13	1
500	13	-6	15	-2	15	2	19	-1
300	19	-12	20	-6	22	2	24	-4
200	20	-12	19	-5	21	1	25	-6
150	21	-10	15	-4	16	1	20	-4
100	21	-9	13	-3	8	2	16	-4

#446 Szeged (46°N, 20°E)

mb	JAN		APR		JULY		OCT	
	E/W	N/S	E/W	N/S	E/W	N/S	E/W	N/S
850	3	0	5	1	2	-4	5	-2
700	6	-2	8	3	5	-4	7	-3
500	11	-3	12	4	8	-3	10	-6
300	17	-6	19	3	11	-4	12	-9
200	21	-9	22	1	20	0	15	-10
150	24	-9	21	1	24	4	18	-8
100	25	-9	18	1	14	7	17	-5

\* Speed is in knots; winds from the west and south are positive